Honeywell
Honeywell Information Systems Italia

PRT 142-143-144-145-146-147-148-149-163-166-168-169 SUBSYSTEM

VOLUME 2 TABLE OF CONTENTS (T.o.C.)

This volume is applicable to those products having the following model numbers:

- See Model Number Reference P.N. 4.836.2.001.0

Binder 1.5 inch, 3 ring

Title window

T.o.C. P.N. 4.836.2.004.0

Description

1	PDS	Integrated Controller Subsystem	78A102190
2	PDS	Standard Controller Subsystem	78A102189
3	PDS	ATA 140 D.O.E.	78A102793
4	PDS	GOC 100 Integrated Controller	78A103075
5	PDS	GOC 200 Standard Controller	78A102858
6	PDS	ALI 310 Power Supply	78A102824
7	PDS	Mem 170+180 Buffer Memory	300740300/A

Installation	4.836.0.000. /A
Maintenance	4.836.4.000. /A
Preventive Maintenance Log	4.033.4.076. /A
Maintenance Schedule Type G	4.014.4.640. /A
Lubrication Plan	4.014.4.641. /A
Parts Catalog	4.836.5.000.

11.5.1970

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SOTTOSISTEMA PRT 142-143-144-145-146-147-148-149-163-166-168-169

INDICE DEL VOLUME 2

Questo volume è valido per i prodotti aventi i seguenti codici:
. Vedi riferimento codici prodotto: 4.836.2.001.0

Raccoglitore da 1,5" a 3 anelli

Finestra

Indice 4.836.2.004.0

Descrizione

1	PDS	Sottosistema con governo integrato			78A102176
2	PDS	Sottosistema con governo standard			78A102177
3	PDS	ATA	140	Attuazione	78A101868
4	PDS	GOC	100	Governo integrato	78A102128
5	PDS	GOC	200	Governo standard	78A101888
6	PDS	ALI	310	Alimentatore	78A102110
7	PDS	MEM	170+180	Memoria Buffer	300740301

Installazione	4.836.0.000.
Manutenzione	4.836.4.000.
Piano Manutenzione	4.033.4.076.
Scheda Manutenzione tipo G	4.014.4.640.
Piano Lubrificazione	4.014.4.641.
Catalogo	4.836.5.000.

11.5.1970

DESCRIPTION

1

P.D.S. I51/C PRINTING SUBSYSTEM WITH INTEGRATED CONTROLLER

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1. DOCUMENTS LIST

1.1. Documents to be enclosed

1.1.1.	E.P.S. I51-C printer,	No. 371075
1.1.2.	P.D.S. ATA 140 - D.O.E.	No. 78A101868
1.1.3.	P.D.S. GOC 100 - Integrated controller	No. 78A102128
1.1.4.	P.D.S. ALI 310 Power supply	No. 78A102110
1.1.5.	E.P.S. I51-C Printer (Alleged)	No. 371076
1.1.6.	Specifications - I51-C interface	No. 331946

1.2. Documents called for

1.2.1.	Specifications - Integrated Interface	No. 140248440
1.2.2.	Specifications - SCL1 Standard	No. 300740400
1.2.3.	Specifications - Common Requirements for the design of GEISI products	No. 300140030

2. GENERAL CHARACTERISTICS

2.1. Description

The I51-C printing subsystem consists of three groups

a) I51-C printer
b) wing A containing the controller and the D.O.E. electronics
c) wing B containing the power circuits and the services.

The subsystem has been realized to work in connection with the central processor of the 100 line.
The connections of the devices both in the subsystem and in the system have been realized by means of standard cables.

2.2. Functional characteristics

2.2.1. I51-C - The printer cabinet contains all the electromechanic devices, necessary to the performance of the printing, of the paper movement, of the inked ribbon movement, and the operating panel.

2.2.2. WING A - The following devices are located in this 100 series standard structure:

a) GOC 100 - Integrated controller
It checks the data exchange, related to the printing and the paper transport, between CPU and printer.

b) ATA 140 - D.O.E.
It contains the controller and the D.O.E. between the GOC 100 and the printer electromechanic devices.

2.2.3. WING B - It includes:

a) ALI 310 - Power supply which supplies all the local voltages to the electronics of the printing, to the paper movements, to the services and which includes the subsystem driving electronics (ON, OFF).

b) ALI 290 - Mains filter.

c) ALI 260 - Panel for a.c. check and distribution.

d) VAR 59I - Device for the connection of a.c. to the system operating panel.

ST

2.3. Physical characteristics

2.3.1. Models

The following models are available:

a) Subsystem for the printing of 250 l.p.m., with 64 characters, with 104 printed columns.
It is possible to obtain the enlargement to 120 or 136 printed columns, and the application of the second paper movement by option.

b) Subsystem for the printing of 340 l.p.m., with 64 characters, with 104 printed columns.
It is possible to obtain the enlargement to 120 or 136 printed columns, and the use of the second paper movement by option.

c) Subsystem for the printing of 640 l.p.m. with 64 characters, with 104 printed columns.
It is possible to obtain the enlargement to 120 or 136 printed columns, and the use of the second paper movement by option.

d) Subsystem for the printing of 430 l.p.m. with characters in CMC7 type, with 120 printed columns.
By using the subsystem for the printing in normal characters, the printing speed is 600 l.p.m..

e) Subsystem for the printing of 340 l.p.m. with 64 characters, with 160 printed columns, with two paper movements.

f) Subsystem for the printing of 640 l.p.m. with 64 characters, with 160 printed columns, with two paper movements.

2.3.2. Versions

All the models sub points a) b) c) d) e) f) are available in the European version, i.e.: 3 phases; 220V; 50 Hz.
The models sub points a) b) c) e) f) are available also in the USA version, i.e.: 3 phases with neutral; 280V; 60 Hz.
See group standard B01.48 par. 6 and 7 for the ISI electronic tolerations.

2.3.3. Sizes

For wings A and B sizes, refer to page n° 9 .
For the printer sizes refer to the related P.D.S.

2.3.4. Weights

WING A (controller)	about	105 Kg.
WING B (power supply)	about	150 Kg.
Printer	about	300 Kg.

ST

2.4. d.c. absorption

The maximum absorption on the +20 V_{dc} is of 9.5 A, dissipated power 190 W.
For the tolerances on the voltage refer to the specifications of the SCL1 standard No. 300740400.

2.5. a.c. absorption

The maximum absorption, among the various subsystems, is:

Phases	50 Hz	60 Hz
X	4.7 A	5.2 A
Y	5.1 A	5.6 A
Z	5.5 A	5.7 A

2.6. Environment characteristics

Temperature and humidity must never cause condensing on the devices.
For further details refer to: "Common requirements for the design of GEISI products". No. 300140030.
The 300 lpm subsystems on the average dissipate 1120 CAL (280 BTU).
The 600 lpm subsystems on the average dissipate 1320 CAL (320 BTU).

3. INTERFACES

3.1. Controller-CPU interface

For the description of such an interface refer to specifications No 140248440.

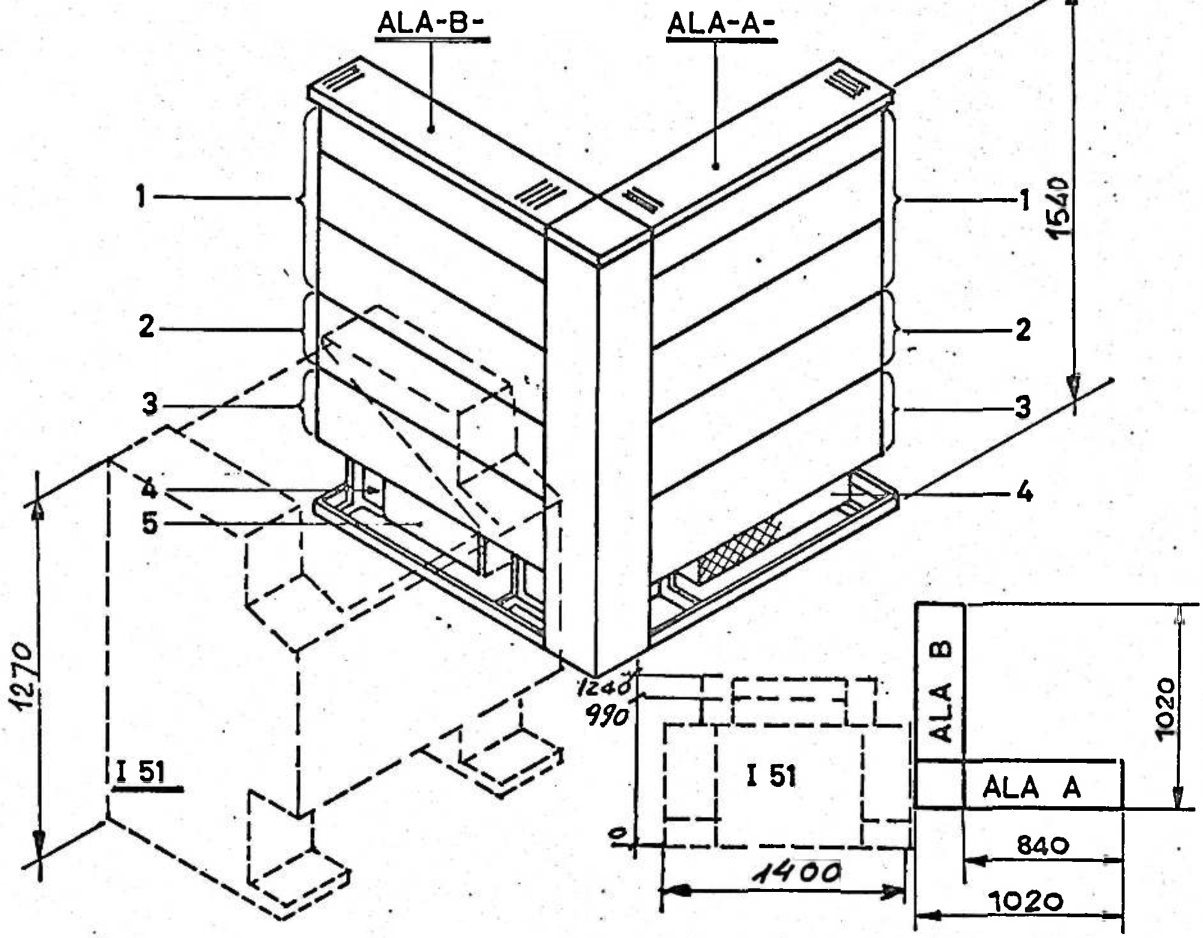
4. PROGRAM CONSTRAINS

Due to the I 51/C mechanics speed it is possible to send interline commands with frequency up to 1100/min.

5. TESTING PROCEDURES

5.1. After having tested the single elementary units according to the procedures given in the related specifications, the subsystem is tested by means of the special diagnostic programs.

INTEGRATED SUBSYSTEM



ALA -B-

1_ ALI 310 _ POWER SUPPLY

2_ ALI 260 2)
3_ ALI 260 1} _ PROTECTION & A.C. DISTRIBUTION PANEL

4_ ALI 290 _ MAINS FILTER

5_ VAR 591 _ A.C. DRIVING PANEL

ALA -A-

1 _ ATA 140 _ ACTUATOR

2 _ GOC 100 _ STANDARD CONTROLLER

3 _ BOX EMPTY

4 _ VAR 332/D/P _ VENTILATION

GENERAL ELECTRIC
GENERAL ELECTRIC INFORMATION SYSTEMS ITALIA

DISEGNO:	PAG	REV
78A102190	9 F	A

Cod. 3898113Q

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P.D.S. I51-C SUBSYSTEM WITH STANDARD CONTROLLER

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0.1.2.	P.D.S. of ATA 140 D.O.E.	n° 78A101868
0.1.3.	P.D.S. of ALI 310 power supply	n° 78A102110
0.1.4.	P.D.S. of GOC 200 controller	n° 78A101888
0.1.5.	Specifications of MEM 170 memory	n° 300740300
0.1.6.	E.P.S. of I51-C printer (II°)	n° 371076
0.1.7.	Interface specification IS1-C	n° 331946
0.2.	DOCUMENTS CALLED FOR	
0.2.1.	Specifications of "ISI Standard Peripheral Interface"	n° 300740110
0.2.2.	Specifications of "Common Requirements to design GEISI Products"	n° 300140030
0.2.3.	Specification of "SCL1 Standard"	n° 300740400

1. GENERAL CHARACTERISTICS

1.1. Description

The I51-C subsystem consists, beside of the parallel printer, of all the other devices suitable to drive and check its performance when connected with one of the 100 line central processors.
The subsystem consists of three physical groups:

- I51-C Printer
  It contains the assemblies for printing, for the paper movement, the ribbon movement, etc.
- WING A
  It contains the controller and D.O.E. electronics.
- WING B
  It contains the power electronics and the services and the local power supplies.

The connections of the various devices between them and of the whole subsystem to the system consist of by standard cables.

1.2. Functional characteristics

1.2.1. I51-C

The cabinet of the printer contains all the electromechanic devices necessary to the printing, to the paper movement and to the inked ribbon movement; in addition, it contains the operating panel and all the devices suitable to supply the signals necessary to insure a good performance.

1.2.2. WING A

The following devices are located in this standard ISI 100 series structure:

- GOC 200. Standard controller: it checks the connection between the subsystem and the central processor and it is in charge of all the command and check operations for the printing and paper movement.

- MEM 170. It is a magnetic cores memory which allows the subsystem to perform all the "off-line" operations, i.e. without using the central processor devices.
- ATA 140. It is the assembly of the electronics for the check and the adjustment between the controller and the printer.
- VAR 332. Ventilation device.

1.2.3. WING B

It includes:

- ALI 310. It is the power supply which supplies all the local voltages to the electronics for the printing, the paper movement and the services.
- ALI 290. A.C. network filter.
- ALI 260. Panel for the a.c. check and distribution.
- VAR 591. Device to provide a.c. voltages to the operating panel of the system.

1.3. Physical characteristics

1.3.1. Models

The following subsystems are available:

1) • Subsystem for the printing of 800 lines per minute using 48 adjacent characters and performing single spaces with 120 printing positions. Options are available for the enlargement to 136 printing positions and for the second paper transport. Using 64 crts, printing speed is 640 lpm.

2) • As above but with 160 printing positions and second paper transport.

3) • Subsystem for the printing of 1100 lines per minute using 43 adjacent characters and performing single spaces with 120 printing positions. Using 64 crts, speed is 830 lpm. Options are available for the enlargement to 136 printing positions and for the second paper transport.

4) • As above, but with 160 positions and second paper transport.

5) • Subsystem with 120 printing positions, 15 crts CMC7-type magnetics, with the following printing speeds:

CHARACTERS	MAGNETIC RIBBON MOVEMENT	SPEED
49	NO	730 lpm
15 CMC7	YES	730 lpm
15+49	YES	430 lpm

6) • Subsystem with "newspaper" tipe character drum with 120 printing position. The speed is 800 lpm with 64 crts and 640 lpm with 64 crts.
An option is available for the second paper transport.

1.3.2. Versions

All the subsystems listed in the pervious paragraph are supplied by the three-phase voltage 220V 50 Hz.
In addition, the subsystem 1),2),3),4) are available also with three-phase power supply 208V 60 Hz.

1.3.3. Sizes

For the sizes of wings A and B refer to page 10
For the sizes of the printer, refer to the related specifications.

1.4. D.C. Absorptions

The subsystem electronics is supplied with the D.C. voltage +20V supplied by the system power supply. The absorption is of 15.5 A.
The dissipated power is 310W.
For the tolerances on the voltage, refer to the SCL1 standard specifications, No. 300740400.

1.5. A.C. absorption

The maximum absorption among the various subsystem is given in the following table:

	220V 50 Hz	208V 60Hz
Phase X	6.2 A	6.5 A
Phase Y	6.4 A	6.7 A
Phase Z	5.8 A	6.1 A

For the tolerances of manifacturing ISI electronic's see standard group BOI.48 par. 6 and 7.

1.6. Weights

The weight of the individual groups is the following:

. I51-C	about	300 Kg.
. WING A	about	105 Kg.
. WING B	about	150 Kg.

1.7. Environment characteristics

Temperature and humidity must never cause condensing on the devices.
For further details refer to:
"Common requirements for the design of GEISI products"
No. 300140030.
The 800 lpm subsystems dissipate on the average 1400 Cal. (350 B.T.U.); the 1100 lpm s/s dissipate 1650 Cal. (415B.T.U.).

2. TESTING PROCEDURES

After having tested the single elementary units according to the procedures given in the related specifications, the subsystem is tested by means of the special diagnostic programs.

3. INTERFACES

3.1. Controller-central processor interface

For the description of this interface refer to specifications No. 300740110

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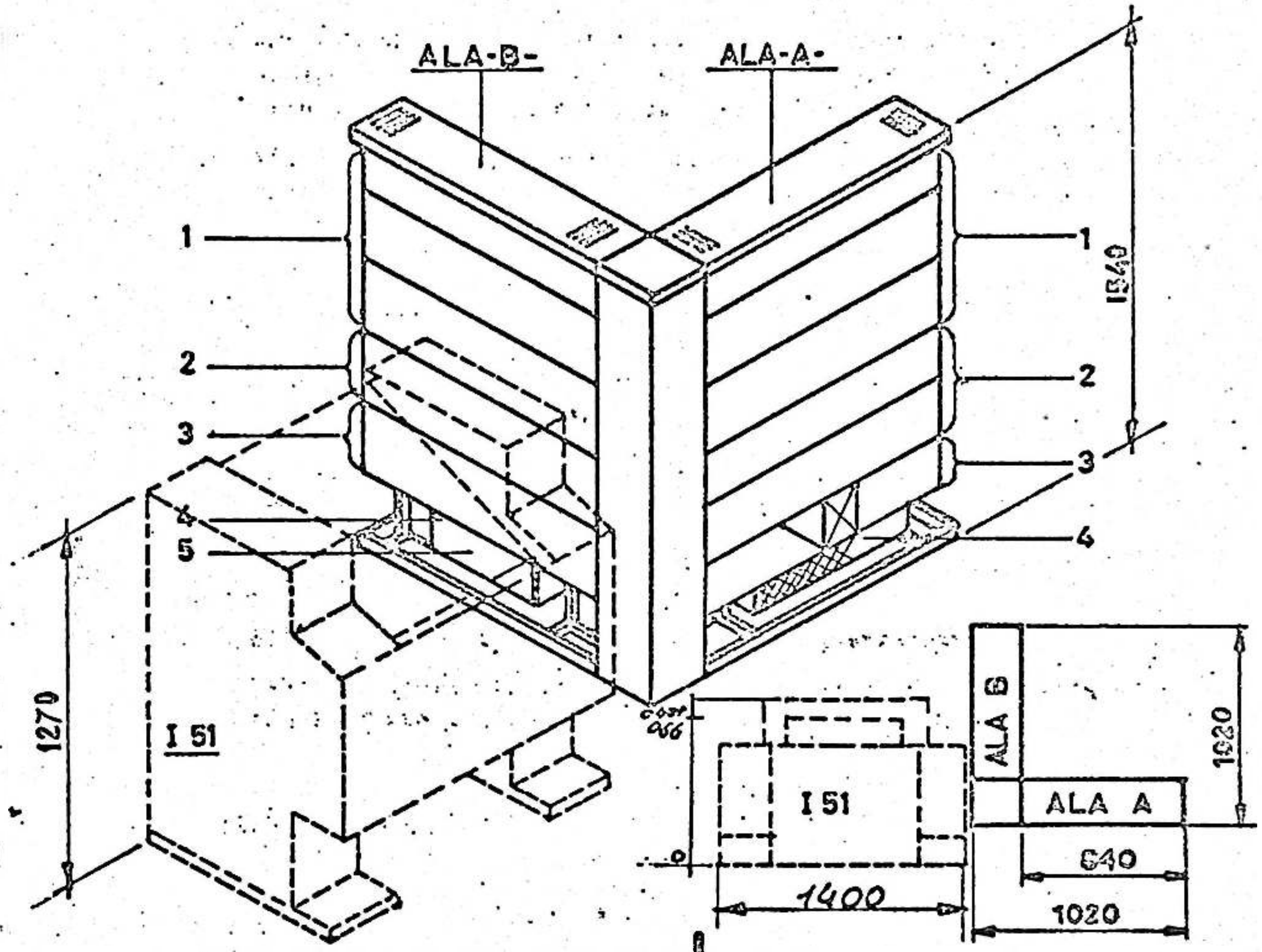
STANDARD SUBSYSTEM



ALA -B-

1_ ALI 310 _POWER SUPPLY

2_ ALI 260·2· } PROTECTION & A.C. DISTR. PANEL
3_ ALI 260·2·

4_ ALI 290 _MAINS FILTER

5_VAR 591 _A.C. DRIVING PANEL

ALA -A-

1_ ATA 140 · _ ACTUATOR

2_ GOC 200 _ STANDARD CONTROLLER

3_ MEM 170/100_ MEMORY

4_ VAR 332/D/P _ VENTILATION

P. D. S.

Device oriented electronic for I-51 PRINTER containing:

ATA 140

OPZ 141

ATA 142

Panel

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1. GENERAL CHARACTERISTICS

1.1. General

The DOE electronic (ATA 140) for the printer I-51 is contained in a standard wing and it is composed by the photoreading amplifiers, the printing circuits, the control circuits and by the electronic of the panel.

1.1.1. Performance

The ATA 140 has been designed in such a way to completely cover the models of the I-51/C.

The ATA 140 moreover provides the possibility of the 2nd paper-transport and the printing on 160 columns.

1.2. Physical configuration

The DOE is made of two and a half standard SMN modules so subdivided:

a) 1 module for the printing:

b) 1/2 module for the supply to the printing circuits and the wiring to the hammer-coils;

c) 1 module for the storage and amplification of the signals.

1.3. Electrical configuration

It is provided the connection of the ATA140 with the following major units:

a) Printing mechanic.

b) Controller (either GOC 100 or GOC 200).

c) Power supply (ALI 310).

d) Panel .

Standard circuitry used: SCL 1.

2. ENVIRONMENTAL CONDITIONS

2.1. Operating environment

The unit must work in ambients having the following characteristics:

- Temperature 10°C ÷ 38°C
- Relative humidity 20% ÷ 80%
- The temperature gradient can be 11°C per hour max.

3. OPTIONS AND COMPLETIONS LIST

3.1. Options

The ATA 140, undistinguished DOE with one paper transport and 104 printing columns, can have the following options:

a) OPZ 141, option for the 2nd transport;

b) OPZ 143, option for 16 printing columns.

3.2. Completions

To the items indicated at the preceding paragraph can be added the following completions:

a) ATA 142, completion for CMC7;

b) ATA 145, completion for 160 printing columns;

c) ATA 146, completion for the 300 lpm model;

d) ATA 147, completion for the 600-800 lpm model;

e) ATA 148, completion for the 1100 lpm model;

f) ATA 149, completion for the 250 lpm model.

ST

4. OPERATING CHARACTERISTICS

4.1. Operating panel

The operating panel is sitting on the right front part of the printer.
The sketch of the command-table is the following:

OFF	ON	STAND BY	OPERATE
NOSKIP 1	NOSKIP 2	SKIP CHECK PRINT CHECK	CMC7 RIBBON
PAPER 1	PAPER 2		

4.1.1. Push-button OFF

It commands the turn-off of the a.c. voltage and of the local voltages in the subsystem.

To the button there are associated two lighting indications :

a) Red - in the top part of the button, which, if it is present, indicates a failure in the printing subsystem. The signal can be either persistent (lack of a phase, thermal protections,...) or temporary (check ALI 310 or check printing circuits).

b) Yellow- in the bottom part of the button, which, if it is present, indicates the actual presence of the alternate voltage to the subsystem input.
With the subsystem in ON, this light is off.

4.1.2. Push-button ON

It commands the powering-on of the printing subsystem. Two lityellow indications are associated to the button.
The top one indicates the start of the switching-on phase of the subsystem. During this phase there is not any other lamp lit on the command-table.

The bottom one indicates that the switching-on phase is finished and therefore the operability, manual state, of the subsystem.
The opening of either the printing group or of the vertical tabulation door, sets the subsystem in the ON phase, being litonly the top lamp of the button.

4.1.3. Push-button STAND BY

Every time it is pushed, it generates a signal, STAN, that sets the subsystem in manual performance, through the DOE. To the button, the lit blue indication is associated; when this is lit, it indicates the manual state.
The lamp "manual" can also appear either for command from U.C.P. or for some out-of-service occurred in the subsystem.

4.1.4. Push-button OPERATE

It enables, on the DOE, the operating conditions if do not exist conditions either of out-of-service or of persistent manual. To the button, a lit green indication is associated; when this is lit it indicates the operating state of the subsystem.

4.1.5. Push-button NOSKIP 1

It inhibits the possibility to perform jumps on the 1st transport transforming them into single spaces. To the button a lit white indication is associated. When we wanted to work without the loop,i.e. the jumps are not utilized, it is necessary to enable the button so that it inhibits the "presence of the loop" check.

4.1.6. Push-button NOSKIP 2

See the paragraph 4.1.5. referred to the 2nd transport. It exists only in case of presence of the OPZ 141.

4.1.7. Push-button PAPER 1

Pushing the button, we cause the paper advance on the 1st transport. The jump stops at the reading of the 7th track of the loop.
If the loop is not mounted, the jump endurance is a function of the pushing-time.
The button operates only when the subsystem is in manual state.
If the button NOSKIP 1 is enabled, the paper advance is made with single spaces.
To the button a lit red indication is associated; when it is lit,it indicates the lack-of-paper or torn-paper on the 1st transport.
The signal comes always with the STAND BY indication/

4.1.8. Push-button PAPER 2

See the paragraph 4.1.7. referred to the 2nd transport. It exists only in case of presence of the OPZ 141.

4.1.9. Lit button SKIP CHECK

Red lamp indicates, if lit :

a) lack of loop on the 1st transport;

b) lack of loop on the 2nd transport;

c) intervention of the jumps time-check of the 1st or the 2nd transport.

This signal always comes with the STAND BY indication.

4.1.10 Lit button PRINT CHECK

Red indication of check mistake in the photodiso code reading.

4.1.11. Lit button CMC7

It is a white light indicating the awailability of the subsystem to operate in CMC7.
It exists only in presence of the ATA 142.

4.1.12. Lit button RIBBON

It is a red lamp which indicates the magnetic ribbon end while operating in CMC7.
It always comes with the STAND BY indication.
It exists only in presence of the ATA 142.

4.2. Back operating panel

It is sitting in the right part of the printer back and it is composed by the duplication of four buttons of the operating panel.

It has as a support a little cabinet fixed to the printer frame.

The sketch is the following:

STAND BY
OPERATE
PAPER 1
PAPER 2

4.2.1. Push-button STAND BY

It has the same functions as the corresponding button of the operating-panel, paragraph 4.1.3.

4.2.2. Push-button OPERATE

It has the same functions as the button of equal name on the operating-panel , paragraph 4.1.4.

4.2.3. Push-button PAPER 1

It has the same functions as the button of equal name on the operating-panel paragraph 4.1.7.
It does not have the light indication.

4.2.4. Push-button PAPER 2

It has the same functions as the button of equal name on the operating-panel, paragraph 4.1.8.
It does not have the light indication.

ST

4.3. Signals check

This check must be performed by DOE side.

4.3.1. Push-buttons check

Depressing the buttons indicated below, verify that the signals go to the values given in the table

PUSH-BUTTON	SIGNAL	Associated light		Electrical value	
			NOTES	from	to
STAND BY	NAST			0	+ 5
		MAN 1L		+ 20	0
		MAN 2L		+ 20	0
OPERATE	SEPO			0	+ 5
	SEPON			+ 5	0
		AUT 1L	1	+ 20	0
		AUT 2L	1	+ 20	0
NOSKIP 1	SEC 1			0	+ 5
	SEC 1N		4	+ 5	0
NOSKIP 2	SEC 2			0	+ 5
	SEC 2N		4	+ 5	0
PAPER 1	SEP 1			0	+ 5
	SEP 1N			+ 5	0
		DIC 1L		+ 20	0
PAPER 2	SEP 2			0	+ 5
	SEP 2N			+ 5	0
		DIC 2L	3	+ 20	0

NOTES

1) If there does not exist any cause of out-of-service
2) Remove the paper from the 1st transport and depress the button PAPER 1
3) Remove the paper from the 2nd transport and depress the button PAPER 2
4) The light is straightly associated with the button sitting in the panel.

4.3.2. Light signals check

Light indication	Signal		Electrical value	
		NOTES	from	to
SKIP CHECK	LUCOL	1	+ 20	0
PRINT CHECK	ERARL	2	+ 20	0
CMC7	CAMAL	3	+ 20	0
RIBBON	NAFIL	4	+ 20	0

NOTES

1) a. Remove the loop from the 1st transport and operate the relative paper movement.
   b. Remove the loop from the 2nd transport and operate the relative paper movement.
   c. Put a loop without holes and command a jump, 1st or 2nd transport.
2) Get dark a photodisc track
3) Preset the printer for CMC7
4) Preset the printer for CMC7, set FINAB to ground (G.26.13) and command an automatic movement..

5. OPERATIONS THEORY

5.1. General block diagram

In the general block diagram ≠ 78 100555 there are indicated the functions of the ATA 140, as well as the options and completions.

The indicated functions are:

a) Regeneration and decoding of column address, deskewing, driving of the printing coils, check ALI 310 and check of the hammer-drive circuits.

b) Photoreading and apeed control of the roller.

c) Paper and ribbon movements.

d) Paper checks and presence of the local voltages check.

e) General logic.

f) CMC7 ribbon movement and CMC7 checks.

g) Filters and amplifiers for lamps and relays.

5.1.1. Regeneration and predecoding

A suitable addressing is necessary in order to perform the selection of the characters to be printed in the suitable columns.
The address is sent by the controller in code of 8 bits, in order to minimize the number of the lines exchanged between controller and DOE.
The address decoding is performed in two times.
A predecoding is made, using two boards DECO, then a second decoding, the last one, is made in the board LOSP.
In this way we obtain the excitation of the FF related to, the wished column, if the printing command, CODIN, arrives.

5.1.2. Printing command (CODIN)

The signals coming from the photodisc are sent to the controller; it checks if the character actually present under the printing line is equal to the one stored in the memory.
If the comparison is positive, the column address, normally sent, comes also with the printing command that sets the FF relative to the addressed column. (For the interface timing see the chapter 5.2.1.1.2.).

5.1.3. Deskewing

For every character to be printed it is necessary that the controller perform a memory sweep to set all the FF's which will have to print. The function of the FF's is to recover the memory sweep time. At the reset, at the same time on all the FF's, those univibrators the FF's of which had been set, before, are excited. Scope of the univibrators is to recover the fly time difference of the various hammers, taking them to print at the same time.

5.1.4. Printing coils drive

In the printing coils the current begins to flow when the univibrators of deskewing , seen above, return in the stable state giving a command pulse to the printing SCR's.
The flowing time of the current is fixed by the circuit constants (R. C. L.).
The max driving period of a coil is less than 6,8 msec. The mechanical recovery of the hammers has a period of 18.7 msec, therefore no printings on the same column at less than 18.7 msec can be commanded.

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5.1.5. Check ALI 310

If the ALI 310 has not completed the charge cycle in its maximum time (18.7 msec) the time check provided on the ATA 140 intervenes putting the S/S in state of OFF-ALERT (lamps of the push-button OFF in the operating panel, lit).
On the DOE in position I 35 the lamp VI 111 switches on.
Turning again the S/S on, with an accidental anomaly, the signals are reset; if the anomaly were persistent, the initial conditions are confirmed.

5.1.6. Check of the printing circuits

To every paper end, sent forth by the ALI 310, it is controlled the state of the printing circuits, to show, if a failure occurred to the circuits, the damage also of the printing electromagnets.
In case that there is an anomaly the ATA 140 sets the S/S in OFF-ALERT and it signals the group in which it is, lighting in position L 35 the lamps:

VIS 11: anomaly in the circuits of the columns 1÷ 32
VIS 21: " " " " " " " 33÷ 64
VIS 31: " " " " " " " 65÷ 96
VIS 41: " " " " " " " 97÷128
VIS 51: " " " " " " " 129÷160

5.1.7. Photoreading

5.1.7.1. Character disc signals

From the reading head of the disc it is obtained the character code signal and a timing signal. These, after having been amplified by suitable circuits and transformed to be suitable for the standard, are sent to the controller.

5.1.7.2. Stop paper movement signals

The signals coming from the vertical tabulator head related to the 1st and or the 2nd paper movement are transformed into standard level to be sent to the controller.
The signals coming from the spacing disc of the 1st or the 2nd movement are utilized in the DOE transforming them into pulses to be sent to the controller.

5.1.8. Roller speed check

Should any roller deceleration occur, or there were not the clock signal, the ATA 140 signals it setting the S/S out-of-service and lighting in position I 35 the lamp CORU 1.

5.1.9. Paper movements

The controller can send commands of paper movement on the 1st and/or the 2nd transport.
The minimum time for a clutch command must be of 5.5 msec.
The minimum time for a brake command must be of 15 msec.
At the same time of the paper movement there are performed the following controls:

a) loop presence on the 1st transport

b) loop presence on the 2nd transport

a) and b) set the S/S in manual state in case of absence of the ribbon jump check.
Moreover a time check is made by the controller on the jumps; this check sets the S/S out-of-service if its period is longer than 3 sec.
The intervention of these checks switches on the light SKIP-CHECK on the operating panel.

5.1.10. Ribbon movement (normal printer)

At every command of paper movement, the ATA 140 commands the movement of the inked ribbon.
The attraction of the motor movement relay stays as long as 1.5 seconds, for both top or bottom motor.
A seasonable device sitting in the printer signals the end of the ribbon and the ATA 140 provides to reverse the movement.

5.1.11. Paper checks

The following paper checks are performed:

• Almost-end-of-paper	1st and/or 2nd transport
• End-of-paper	1st and/or 2nd transport
• Torn paper	1st and/or 2nd transport

They are significant only in presence of the paper movement they are related to.
The almost-end-of-paper is stored and sent to controller.
End-of-paper and torn paper set the S/S out-of-service and they turn on the lamps of the PAPER 1 and/or PAPER 2 buttons of the operating panel.

5.1.12. Voltages presence check

There are two checks.
The first one indicates the presence of the a.c. and d.c. voltages: 2.5 V and 90 V in the subsystem.
The second indicates the reached steady state of the motors.

5.1.13. General logic

They are all those functions which concern the sub-sustem;

- Manual
- Automatic
- Ribbon reverse
- Out-of-service
- ALI 310 under charge

5.1.14. Ribbon movement (CMC7 printer)

5.1.14.1. Movement with normal ribbon

At every command of paper movement, the ATA 140 - ATA 142 commands the movement of the inked ribbon.
We obtain the movement mantaining always excited a clutch, top or bottom, and commanding the motor-movement relay for 1.5 sec., top or bottom motor.
A suitable device, sitting on the printer, signals the end of the ribbon and the ATA 140 - ATA 142 provides to reverse the movement by exchanging the clutch and the motor-movement relay excitation.

5.1.14.2. Movement with magnetic ribbon

At every paper movement the ATA 140 - ATA 142 commands the magnetic ribbon movement. This movement can happen only in one direction and is obtained mantaining always excited the relay of the top motor movement, commanding the top-clutch for 20÷35 msec and relaxing at the same time the bottom-clutch to allow the advance of the ribbon.
During the printing the magnetic ribbon is braked by the bottom-clutch.
In case of printing of normal characters with magnetic ribbon, the command to the bottom clutch is taken to 14÷26 msec to decrease the ribbon advance.
Either at the subsystem turn on or closing the drum block, a normal ribbon movement is made as long as 20÷35 msec.
Magnetic ribbon movements are not effected when a paper movement is manually commanded.
A suitable device, sitting in the prin-

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ter signals the magnetic ribbon end. The DOE shows it with the light RIBBON of the operating panel, and setting the subsystem oht-of-service.

			Ribbon Movement		
			WATTING	ADVANCE	
MOT.	TOP.			▨	NORMAL RIBBON
	BOTT.				
CLUTCH	TOP.		▨	▨	
	BOTT.				
MOT.	TOP.				
	BOTT.			▧	
CLUTCH	TOP.				
	BOTT.		▧	▧	
MOT.	TOP.		▨	▨	MAGNETIC RIBBON
	BOTT.				
CLUTCH	TOP.			▨	
	BOTT.		▨		

The etching indicates the commanded devices.

5.1.15. CMC7 checks

These are the checks peculiar to the operation with magnetic ribbon:

- ribbon end
- unit occupied for magnetic ribbon movement
- Magnetic ribbon movement with normal characters printing.

5.1.16. Filters and amplifiers

They are either those circuits which filter the signals coming from the microswitches or those circuits suitable for driving lamps and relays.

5.2. Intermediate block diagram

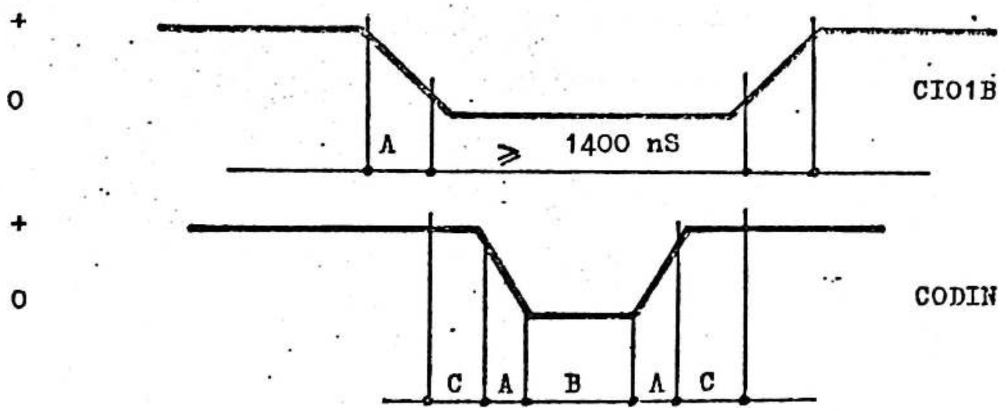
5.2.1. Interface with controller

On the IBD drawing 78B100554/1 there are sketched in P1 the signals generated by the controller and utilized by the DOE; in P2 the signals generated by the DOE and utilized by the controller.

5.2.1.1. Signals from controller

5.2.1.1.1. CI01B ÷ CI08B - CODIN

Signals of column address in the interface between controller and DOE.
The address signals, coming from the controller, strobed by the consent-pulse (CODIN) before reaching the board LOSP are predecoded by the board DECO; either this last and the LOSP are defined in their functional specifications, whose analysis permits to establish the following interface timing.



A ≤ 300 nsec

B ≥ 700 nsec

C ≥ 150 nsec

5.2.1.1.2. MOC1N

Paper-movement signal referred to the 1st transport.
It is a level and it is significant at logic level 1.

5.2.1.1.3. MOC2N

Paper-movement signal referred to the 2nd transport.
It is a level and it is significant at logic level 1.

5.2.1.1.4. MASEN

Pulse indicating the intervention of the time check on the jumps.
It is significant at logic level 1.

5.2.1.1.5. VACAN

Charge validation to the ALI 310.
It is a level significant at logic level 1.

5.2.1.1.6. SESEN

Set in manual state by command from CPU.
It is a pulse significant at logic level 1.

5.2.1.1.7. ERARN

Check error on the photodisc bits.
It is a level and it is significant at logic level 1.

5.2.1.1.8. NOAVN

Printing signal of normal characters with magnetic ribbon.
It is a significant level at logic level 1.
In presence of this command, the CMC7 ribbon performs a reduced advance.

5.2.1.2. Signals to controller

5.2.1.2.1. F011N ÷ F018N

Signals coming from the loop tracks of the 1st transport. They are significant at logic level 1.

5.2.1.2.2. TI1ON

Interline clock of the 1st transport.
It is a pulse of 1.2 µsec. Significant at logic level 1, it is inhibited during the first 5.5 msec after the paper movement start.

5.2.1.2.3. NOS1N

Jumps-inhibition on the first transport.

It is significant at logic level 1. It is generated depressing the button NOSKIP 1 of the operating panel.

5.2.1.2.4. COS1N

Manual command for jump on the 1st transport.
It is significant at logic level 1.
It is generated depressing the button PAPER 1 of the operating panel or of the back operating panel if the subsystem is in manual status.

5.2.1.2.5. FO21N ÷ FO28N

Signals coming from the loop tracks of the 2nd transport. They are significant at logic level 1.

5.2.1.2.6. TI2ON

Spacing clock of the 2nd transport.
It is a pulse of 1.2 μsec. Significant at logic level 1, it is inhibited during the first 5.5 msec after the paper movement start.

5.2.1.2.7. NOS2N

Jumps-inhibition on the second transport.
It is significant at logic level 1. It is generated depressing the button NOSKIP 2 of the operating panel.

5.2.1.2.8. COS2N

Manual command for jump on the 2nd transport.
It is significant at logic level 1.
It is generated depressing the button PAPER 2 of the operating table or of the back operating panel if the subsystem is in manual status.

5.2.1.2.9. SE01N ÷ SE07N

Code signals from photodisc.
They are significant at logic level 1.

5.2.1.2.10. SEO9N

Code signals check of the photodisc.
Significant at logic level 1.

5.2.1.2.11. DEPIN

Clock from photodisc.
This pulse has a wave shape which indicates the light (logic level 1) and the dark (logic level 0) of the photocell.

5.2.1.2.12. RESAN

Signal of partial out-of-service.
It is significant at logic level 1.
The paper malfunctions are not covered by this out-of-service.

5.2.1.2.13. RUO1N - RUO2N

Speed-code bits, function of the printing speed.
The table shows the correspondence between code and printing speed.

LOGIC LEVELS		Printing speed
RUO1N	RUO2N	
0	1	CMC7
1	1	300 lpm
1	1	600-800 lpm
1	0	1100 lpm
0	0	250 lpm

5.2.1.2.14. MAREA

Out-of-service signal.
Significant at logic level 1.
It disappears as soon as the DOE can accept all the possible commands.
At the end of the turn-on phase, it disappears provided that there are not causes of out-of-service.

5.2.1.2.15. FU22A

Signal of manual status.
It is significant at logic level 1.
It appears for any of the following: out-of-service, button STAND BY, loop presence check and command from CPU.
It is reset by the button OPERATE, provided that all the causes that had generate it have disappeared.

5.2.1.2.16. SAMAN

Signal of preset printer with magnetic ribbon.
It is significant at logic level 1.

5.2.1.2.17. MEOCN

Signal of occupied mechanical part by magnetic ribbon movement.
It is significant at logic level 1.

5.2.1.2.18. CARIN

Signal of ALI 310 under charge.
It is generated by the charge validation slope and by the charge start signal coming from ALI 310.
It disappears when it is possible to print.
It is significant at logic level 1.

5.2.1.2.19. TES1N

Signal of almost end of paper on the 1st transport. Significant at logic level 1.

5.2.1.2.20. TES2N

Signal of almost end of paper on the 2nd transport. Significant at logic level 1.

5.2.2. Interface with the ALI 310 - MOC - Panel

They are showed on the drawing ≠≠ 78B100554/2 IBD as:

- P1 Signals coming from MOC
- P2 Signals coming from panel
- P3 Signals sent to panel
- P4 Signals coming from ALI 310
- P5 Signals sent to ALI 310
- P6 Signals sent to MOC

5.2.2.1. Interface with MOC and panel

See the BGE specifications "I51 C: INTERFACE"

5.2.2.2. Interface with ALI 310

See PDS ALI 310.

5.2.3. Decoding, Deskewing, Printing electromagnets driving, Controls.

On the IBD dwg 78B100554/3 it is sketched all the printing phase and its controls, as made by the DOE. The 8 bits of column address, CI01B ÷ CI08B, as well as the trigger command, CODIN, are put into a coding network formed by boards DECO.

At the output there are 15 signals rightly powered, DE01A ÷ DE15A, partially decoded, merging into the boards LOSP, where it is completed the coding for the selection of the 160 printing columns.
The concurrence to electric zero of 4 partially decoded in input at LOSP:

1) DE01A ÷ DE04A
2) DE05A ÷ DE08A
3) DE09A ÷ DE12A
4) DE13A ÷ DE15A

sets the FF related to the addressed column.

The signal REFI1, pulse of 2.5 usec derived from the clock signal of the code photodisc, DEPIA, or present only during the printing phase, since VARI1 and ATOP2 are at 0 V, transfers the information from the LOSP to the board LOMA in such a way to energize the hammer electromagnets.
Ended the printing, in presence of charge validation, VARI2 at +5 V, the ALI 310 provides to charge the SPAM capacitors.
At the end of every charge, two check are made by the DOE:
the first one verifies the performance of the ALI 310, the second one the status of the boards LOMA-SPAM.
The ALI 310 is controlled in the following way:

The ALI 310, received the charge validation, answers with a level at 0 V, 7.8 msec long (INCAN) indicating the waiting time before starting the charge. INCA2, regeneration of ICAN, sets with its leading edge the FF RICA1 and with its trailing edge triggers the univibrator COCI1, with a period of 12 msec.
If within the time of COCI1 the end-of-charge signal (FIRI1) has arrived, all is right, otherwise with the trailing edge of COCI1, being enabled its mask, RICAA at 0 V, the FF CIR01 sets.

CIR01 takes to + 5v CIPA1, signal [illegible] which commands the subsystem turn off, and sets the FF VI111 which turns on the lamp of equal name on the ATA 140 (line I board 35).(TIMING CHART 78B100551/4).
CIR01 comes back to 0V with the subsystem off (MATE2 +5V). At the end of every charge, with the following edge of FIRI2 a pulse is generated, COL01, which controls, through the boards RIAN the state of the hammer drive circuits.
The same check is performed also turning on the subsystem, generating a pulse, POC01, which operates as COL01 does.
If everything is working, the outputs of RIAN (UC01 ÷ UC05) are at + 5V and block COPOA.
If there is a failure, UC01 ÷ UC05 is at 0V and gives way to COPOA.
COP11 ÷ COP51 sets the FF VIS11 ÷ VIS51 which turns on the lamp of equal name on the ATA 140 (line L, board 35) and sets, through ORVIN, the FF DIPA1.
DIPA1 takes to + 5V CIPA1 which turns off the subsystem. DIPA1 disappears when the S/S goes off (MATE2 + 5V).

The signals [illegible] VI111 and VIS11 ÷ VIS51 are taken away at the end of the turn on phase, deriving the signal ATOP2 and transforming it in a pulse (RELA1).

5.2.4. Photoreading and roller speed

On the IBD drawing 78B100554/4, the photoreading and its realized functions are sketched.

The signals coming from the photoreading groups of the mechanic:

N001 ÷ N009 } code photodisc
P001 ÷ P009 }

N011 ÷ N018 } vertical tabulation group 1st transport
S011 ÷ S018 }

N021 ÷ N028 } vertical tabulation group 2nd transport
S021 ÷ S028 }

are amplified with boards FOGE.
To lighted cell it corresponds 0 V in output.

The output signals:

SE01N ÷ SE09N

F011N ÷ F018N

F021N ÷ F028N

are sent to the controller.
The signals coming from the mechanic part:

N010 } clock of code photodisc
P010 }

are amplified with the board DELE.
The output signal DEPIA is at 0 V when the cell is lighted and it is sent to the controller after two regenerations (DEPIN).
Moreover DEPIA is used for the REFI generation (paragraph 5.2.3.) and for the check of the character roller speed.

With the trailing edge of DEPIA, it starts the univibrator SORI1 which drives the UNRA MORUA whose time is more than the one between two following clocks, as such as MORUA is always at 0 V.

The MORUA duration changes depending on the roller. speed.

	TIME BETWEEN TWO CLOCKS	MORUA
CMC7	1300 µsec	1450 µsec
300 lpm	2500 µsec	2700 µsec
600-800 lpm	1200 µsec	1350 µsec
1100 lpm	852 µsec	950 µsec
250 lpm	2500 µsec	2700 µsec

When the roller speed decreases, longer time between two clocks, MORUA behaves to + 5 V and sets the FF CORU1 which turns the subsystem out-of-service and lights the lamp of equal name sitting on the DOE (Line I board 35)
The signal is reset by opening the drum (TIMING CHART 78B100551/3).

The signals coming from the spacing disc:

NO 19 } spacing clock of the 1st transport
SO 19 }

NO 29 } spacing clock of the 2nd transport
SO 29 }

are amplified with boards FOGE.
The output signal TOP1A (TOP2A)° is generated as such as to obtain very quick commutation edges,, COT1N (COT2N).

° the indication in parenthesis is referred to the 2nd transport.

When a paper movement MOC1N (MOC2N) occurs, the univibrator ATT11 (ATT21) triggers for 5.5 msec, and blocks during all its time the eventual output of a spacing clock TI1ON (TI2ON).
Expired the ATT11 (ATT21) pulse, and in presence of MOC1N (MOC2N), COT1N (COT2N) triggers the univibrator TI1O (TI2O).
TI1O (TI2O) is then regenerated to be sent into the controller as spacing clock of the 1st transport TI1ON (TI2ON spacing clock of the 2nd transport).
(TIMING CHART 78B100551/1/2).
For the right subsystem operation, the DOE must signal to the controller the speed of the mechanic model to which it is connected.
This is obtained sending two bits RUO1N and RUO2N opportunely coded with boards PONT.
The table shows the correspondence among: model, bits and board PONT.

MODEL	BITS °		BOARD
	RUO1N	RUO2N	
CMC7	0	1	PONT 8
300 lpm	1	1	PONT 0G
600-800 lpm	1	1	PONT 0G
1100 lpm	1	0	PONT 0L

° As logic levels.

5.2.5. Paper-movement and ribbon-movement

On the IBD drawing 78B100554/5, it is delineated the paper and ribbon movement sequence.
The controller can send commands of paper movement MOC1N (MOC2N).
MOC1N (MOC2N), significant at 0 V, is regenerated and sent, as MAT11 (MAT21), to the brake-clutch circuit sitting in the ALI 310.
MAT11 (MAT21) shall never be less than 5.5 msec because it is mantained at 0 V through the univibrator ATT11 (ATT21) (paragraph 5.2.4.), LEC11 (LEC21) in this case does not have any effectiveness because it is mantained at 0 V being the subsystem in automatic status, SECOA (SECOC) at + 5 V.
At every paper movement command, the ATA140 performs a ribbon movement.
When MOC1N (MOC2N) is at 0 V, we shall have MOC11 (MOC21) at +5 V and then MOCA1 at +5 V.
The output of the univibrator MONOA goes to 0 V and it will remain such as long as 1.5 sec.
The choice of the movement direction is made by FINA1, FF of ribbon reverse, and we shall have the ribbon movement upward if FINA1 is at 0 V: COSU1, top motor command, at + 5 V; and downward if FINA1 is at + 5 V.
During the paper movement the loop presence check is made.
If the loop on the transport is missing, we shall have the signals F017N (F027N) and F018N (F028N) always at 0 V, cells always lighted.
Commanding a movement we shall have TI1ON (TI2ON) at 0 V, and since there is not in jumps inhibition state, FOC11 (FOC21) will be at + 5 V.
The leading edge of FOC11 (FOC21) sets the FF COL11 (COL21) which sets the subsystem in manual status and switches on the signal SKIP CHECK of the operating panel: LUC01 at + 5 V.
The signal is reset replacing the loop and depressing the button OPERATE of the operating panel, or it is blocked depressing the button NOSKIP1 (NOSKIP2) on the same panel.

It is possible to work without loop in the OPERATE status, provided that the jumps-inhibition button, relative to the movement on which the loop does not take a position, is depressed.
To have the possibility to perform jumps without the loop it is necessary to:

- set the subsystem in manual, SECOA (SECOC) at 0 V;
- be in charge validation, VACAN (VARIC) at 0 V;
- take away the jumps inhibition;
- push the button PAPER1 (PAPER2).

This paper movement sets the FF COL11 (COL21) to + 5 V; it, at its time, sets to + 5 V MAT11 (MAT21) through LEC11 (LEC21) at + 5 V.
LEC11 (LEC21) remains in that status as long as COS1A (COS2A) is maintained at 0 V.
The check of the jump duration is performed on the controller which sends, if intervening, a pulse: MASEN.
MASEN sets the subsystem out-of-service as well as the FF SALU1. The set condition of SALU1 sets LUC01 to + 5 V.
LUC01, on its turn, commands the switch on of the lamp SKIP CHECK of the operating panel.
The out-of-service and the light signal disappear depressing the button OPERATE.

With the subsystem in manual status and with the loop, pushing the button PAPER1 (PAPER2) a jump at the sheet beginning is made.
Infact the pressure on the button sets PES11 (PES21) at + 5 V and PES1A (PES2A) at 0 V.
PES11 (PES21) sets the FF COS11 (COS21) taking the command signal to the interface with controller, COS1N (COS2N) at 0 V.

5.2.6. Paper and presence of local voltages checks

On the IBD drawing 78B100554/6 the paper and voltages check performed by the DOE are sketched.
The voltages are controlled by the FF's MATE1 and ATOP1. SOFE1/SOFEA and TATO1/TATOA come to the DOE from the services panel of the ALI 310.
With the subsystem in OFF, we shall have SOFE1 and TATO1 at + 5 V, and SOFEA and TATOA at 0 V.
SOFEA sets the FF MATE1, and TATO1 sets the FF ATOP1.

Switching the subsystem on, there occurs the level exchange between SOFE1/SOFEA which resets the FF MATE1. After 3 sec we also have the exchange between TATO1/TATOA; and the reset of ATOP1.
Opening the drum and/or the vertical tabulation door the subsystem is set out-of-service through ATOP1.
This status is indicated in the operating panel by the partial lighting of the button ON.
The paper checks are performed only during the relative paper movement.

Almost-end-of-paper

CE011 (CE021) in the almost-end-of-paper condition is at + 5 V. In presence of a movement, MAT1A (MAT2A) at 0 V, COC11 (COC21) is at + 5 V and it sets the FF TES11 (TES21).
This condition is signaled to the controller through TES1N (TES2N) at 0 V.

End-of-paper and/or torn-paper

FE011 (FE021) in end-of-paper condition is at + 5 V.
TE011 (TE021) in torn-paper condition is at + 5 V.
When there is a movement, FAM11 (FAM21) is at + 5 V and sets the FF DIC11 (DIC21).
DIC11 (DIC21) at + 5 V lights the lamp PAPER1 (PAPER2) and sets the subsystem out-of-service.
The signals are reset either renewing the paper and depressing the button OPERATE, or turning the subsystem off.

Jumps-inhibition

CES11/CES1A (CES21/CES2A) in normal conditions are respectively at 0 V and at + 5 V.
The FF NOS11 (NOS21) is in reset.
Depressing the button NOSKIP1 (NOSKIP2) the status of CES11/CES1A (CES21/CES2A) is reversed and the NOS11 (NOS21) sets.
This condition is signalized to the controller through NOS1N (NOS2N) at 0 V and the lamp of the button switches on.

5.2.7. General logic

On the IBD drawing 78B100554/7 the logic functions of the ATA 140 are sketched.
With the subsystem off there are the following conditions:

manual : FU22A 0V
out-of-service : MAREA 0V
RESAN 0V
charge phase : CARIN 0V
charge inhibition : VARI2 0V

Switching the subsystem on, the conditions are:

manual : FU22A 0V
out-of-service : MAREA +5V
RESAN +5V
charge phase : CARIN variable from +5V to 0V
charge validation : VARI2 +5V

Depressing the button OPERATE the subsystem is set in automatic state: FU22A +5V.
Hindering the going in automatic of the subsystem the conditions are:
out-of-service CIR01, NAFI1, CORU1, DIPA1, ATOP1 at +5V
paper malfunctions DIC11 (DIC21) at +5V
persistent manual COL11 (COL21) at +5V

In automatic after a printing, the controller sends the charge validation signal: VACAN at 0V.
VACAN sets the FF CARI1 which sets CARIN at 0V, signal of ALI 310 under charge, and, through the sequence VARI1, VARIA, VARI2 and RIVAA fixed at 0V through PONT, signals to the ALI 310 the OK to start the charge of the capacitors on the boards SPAM.
The ALI 310 answers to the charge validation with a signal long 7.8 msec indicating the start of a charge. At the charge end, the ALI 310 sends a signal of charge end, FIRI1, which resets the FF CARI1 and through CARIN at +5V the suitability for the printing is signaled to the controller.

If a printing has really to be done, the controller takes the charge validation away, VACAN at +5V, and then the charge of the ALI 310 is inhibited, VARI1 at OV.
If a printing does not take place, the charge validation remains and the FF CARI1 follows the trend of INCAN and FIRI1 since the capacitors on the SPAM tend to discharge and need timely new charges.
The univibrator RIVA1 is a completion for the connection of the 250 lpm printer, and, as there is not the board PONT, it delays all the charge phases and then the printing.
Infact, going VACAN to OV, VARIA will be at OV.
VARIA, going at OV, fires RIVA1 and hinders the charge validation of the ALI 310 for all the times at which it has been adjusted.

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5.2.8. CMC7 ribbon movement and controls

On the IBD drawing 78B100554/8 the completion for the printing with CMC7 characters is sketched.

On the mechanical part, there is a signal indicating the kind of ribbon used: NORMAL or CMC7.
If the signal is in NORM position, MACA1/MACAA will be respectively at 0V and +5V.
In this way CAMAA will be at + 5V.
SAMAN is at +5V and indicate to the controller the inhibition to print CMC7 characters.
At every paper movement, there is a ribbon movement provided commanding the ribbon motors (parag.5.2.5) while one of the two clutches is always attracted (parag. 5.1.14.1).
If the movement is made upwards, the top motor is commanded, COSU1 at + 5V, the top clutch is always energized: FISU1 at + 5V since FINAB at + 5V and CAMA1 at 0V and MACOA maintained at 0V by CAMAA at + 5V while the bottom clutch is always detached: FIBA1 at 0V since FINA2 at 0V and CAMA1 at 0V and MAMAA is maintained at 0V by CAMAA at +5V.
The movement reversal of the ribbon is given by the status exchange between FINAB and FINA2 (TIMING CHART 78B100551/6).

In the case that the signal is in CMC7 position, MACA1 and MACAA will be respectively at +5V and 0V.
In this condition CAMA1 is at +5V and CAMAA at 0V.
SAMAN will be at 0V and indicates the abilitation to the printing of magnetic characters.
When the subsystem switches on, the command is persistently given to the top ribbon motor: COSU1 at + 5V and it is inhibited the command to the bottom motor: COBA1 at 0V since CAMA2 at + 5V.
At every paper movement, a ribbon movement is performed. Commanding a paper movement we shall have MOCAA at 0V.
The MOCAA edge, if there is the status of available unit, MEOC1 at 0V, triggers the univibrator RIMO1 which with its trailing edge sets the FF COFI1 which commands the top clutch FISU1, unbloking

the bottom one FIBA1 (parag. 5.1.14.2) and it sets the FF MEOC1 which signals to controller, through MEOCN at OV, the unavailability..
The univibrator RIMO1 acts as a delayer for the movement command, and it can also block it in case of paper movement from manual command COS12 (COS22) +5V.
The FF COFI1 is reset by the sum of the univibrators INMO1-REMO1 if the following printing is with CMC7 characters: NOAVN at +5V.
It is reset by the sum of the univibrators MOCO1-REAN1 if the following printing is with normal characters: NOAVN at OV.
This device acts so that the ribbon has a different movement for printing with CMC7 characters (normal movement) or with normal ones (reduced)(MOCO1 + REAN1 INMO1 + REMO1).
The FF MEOC1 is reset by the sum of the univibrators INOC1 - REOC1 (TIMING CHART 78B100551/5).
During the REOC1 time, it is checked if there is the condition end-of-CMC7-ribbon.
When the magnetic ribbon is not completely coiled on the top spindle, FINAA is at + 5V because CAIN1 is at + 5V. (ININ1 and CAMAB at OV; IBD dwg 78B100554/5)
At the ribbon end, FINA1 is at +5V and FINAA at OV because ININ1 is at + 5V.
With FINAC at OV and in presence of RECOA, FIRE1 is at + 5V and gets set the FF NAFI1 which sets the subsystem out-of-service and switches on the RIBBON signal of the operating panel (TIMING CHART 78B100551/6).
NAFI1 is reset either replacing the ribbon and pushing the button OPERATE or switching the subsystem off.
Either turning the subsystem on or closing the drum (parag. 5.1.14.2.) a magnetic ribbon movement is made, with normal displacement.
In fact, RATO1, ATOP2 regeneration, going to OV triggers the ribbon movement sequence setting COFI1.
The movement has a normal displacement because the FF PIMO1 is set and it blocks the chain MOCO1-REAN1.

5.2.9. Filters and amplifiers

On the IBD dwg 78B100554/9 there are described those circuits suitable for filtering the signals coming from microswitches and for amplifying the command signals for relays and lamps.

As filters the circuits ICRE are used: to 0V in input it corresponds 0V in output; to +5V in input it corresponds +5V in output.

INPUT	OUTPUT	FUNCTION
INSU	INSU1	Top ribbon inverter
ININ	ININ1	Bottom ribbon inverter
SEPO/SEPON	POSE1/POSEA	Push-button OPERATE
STAN	NAST1	Push-button STAND BY
SEP1/SEP1N	PES11/PES1A	Push-button PAPER 1
SEC1/SEC1N	CES11/CES1A	Push-button NOSKIP 1
CU01	CE011	µswitch almost-end-of-paper 1st transport
FI01	FE011	" " " " "
TA01	TE011	" torn paper 1st.tr.
SEP2/SEP2N	PES21/PES2A	Push-button PAPER 2
SEC2/SEC2N	CES21/CES2A	Push-button NOSKIP 2
CU02	CE021	µswitch almost-end-of-paper 2nd transport
FI02	FE021	" " " " "
TA02	TE021	" torn paper 2nd tra
CMC7/CMC7A	MACA1/MACAA	Equipment in CMC7
NANO	NONA1	Set CMC7/+10 RM.

As amplifiers circuits LURE and LUME are used: to +5V in input it corresponds 0V in output; to 0V in input it corresponds about 20V in output.

INPUT	OUTPUT	FUNCTION
CIPA1	CIPAB	command to the S/S turn-off relay for ALERT on ALI 310 or printing circuits
COSU1	MOSUN	top ribbon motor command relay
COBA1	MOBAN	bottom ribbon motor command relay
SECOB	AUT1L	comm. OPERATE lamp on oper.panel
SECOB	AUT2L	comm. OPERATE lamp on back panel
SECO2	MAN1L	comm. STAND BY lamp on oper.panel
SECO2	MAN2L	comm. STAND BY lamp on back panel
DIC12	DIC1L	comm. lamp PAPER 1
LUCO1	LUCOL	comm. lamp SKIP CHECK
ERAR	ERARL	comm. lamp PRINT CHECK
DIC22	DIC2L	comm. lamp PAPER 2
NONAA	REMA1	comm. relay CMC7
CAMA3	CAMAL	comm. lamp CMC7
NAFI3	NAFIL	comm. lamp RIBBON

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6. Adjustments

6.1. Magnetic ribbon movement

6.1.1. Foreword

The magnetic ribbon movement, changing from a printer to another, needs a specific adjustment.
The movement time is variable in:

a) 20 ÷ 35 msec when the following printings are of CMC7 characters

b) 14 ÷ 26 msec when the following printings are of normal characters.

6.1.2. Operating routine

For the adjustment, operate in the following way.
With the magnetic ribbon completely coiled on the bottom spindle, command printings with CMC7 characters and adjust the univibrators INMO1 (I-27-1) and REMO1 (I-27-10) in such way that on the magnetic ribbon, there is not overlapping between two following printing lines.
The displacement time is given by the sum of INMO1 + REMO1 where INMO1 = REMO1.

Min displacement time (INMO1 + REMO1) = 20 msec

Max displacement time (INMO1 + REMO1) = 35 msec

Commanding instead printings of normal characters, adjusting the univibrators MOCO1 (I-29-1) and REAN1 (I-29-10) overlap on the magnetic ribbon the profiles of the printed characters such as to maintain a good printing quality.
The displacement time is given by the sum of MOCO1 + REAN1 where MOCO1 = REAN1.

Min displacement time (MOCO1 + REAN1) = 14 msec

Max displacement time (MOCO1 + REAN1) = 26 msec

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6.2. Printing deskewing

6.2.1. Foreword

The printing deskewing univibrators are on the board LOPS; these, at the end of the board check, are all adjusted to 600 usec. From the mechanical specification of the I-51 the maximum spread among the fly time of the hammers is deducible, this spread is 450 usec in the worst case. To obtain a good deskewing and to have besides the possibility to adjust fartherly the printer also after many printing hours, it is opportune to proceed as indicated by the following regulations:

6.2.2. Operating routine

Inserted all the printing boards (LOSP + LOMA + SPAM) and set a printing program of all "Z" characters, the fastest hammer must be seeked, i.e. that one which prints higher referring to the average line.
Operating on the photodisc adjustment, which takes the reading head, that character is taken to print in correct way, with the aid of the deskewing enlarger. After this oparation, all the other characters will be "delayed", i.e. too much slow. Therefore it will be necessary to decrease the univibrator time of every column (potentiometer rotation CCW) and deskew them.
Since the max spread is 450 usec, then it will be possible to have in the machine a univibrator with:

$T_T - \bar{t} = T\text{min}$ where T_T = adjustment time of the univibrator

$600 - 450 = 150$ usec $\bar{t}$ = max spread among the hammers

Therefore it would remain, as theoretical adjustment margin, 50 usec more for the fastest hammer (beeing univibrator tmax = 650 usec) and 50 usec less for the slowest hammer (the univibrator cannot go under 100 usec)

As a matter of fact, in a new printer "t" is never more than 300 usec, then it is:

$$t_{min} = 600 - 300 = 300 \text{ usec}$$

Therefore it is an adjustment in less of 200 usec. This is useful because it allows to recover the fly time increases due to the aging of the mechanical and electrical parts.

6.2.3. Deskewing

In the following table the conversion time/displacement is given for the various rotating speeds of the roller.

RPM	Time (usec)	Displacement (mm)
1100	10	0.47
800	10	0.34
730	10	0.31
430	30	0.55
375	30	0.48

In order to make easier to find the fastest hammer, it is advisable to use paper with horizontal lines and perform the deskewing with the oscilloscope. Once established the real skew of each character, it has to be converted in time with the aid of the above table and the univibrators can be corrected of the necessary amounts.

6.3. Clutch-brake group adjustment

On the paper transport circuit there is a rheostat suitable for the adjustment of the current in the clutch.
The current adjustment has to be performed watching the shaft speed curve with a tachometer, as indicated in the BGE specification:

"Specifications Essais Generaux I 51 C" and

"Specifications Boîte Mouvement I 51 C".

7. Referenced documents

a) P.D.S. ALI 310 drawing ≠≠ 78A102110

b) I 51 C INTERFACE ≠≠

c) SPECIFICATIONS ESSAIS GENERAUX I 51 C ≠≠

d) SPECIFICATIONS BOITE MOUVEMENT I 51 C ≠≠

4

P.D.S. INTEGRATED CONTROLLER

GOC 100

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INTEGRATED CONTROLLER

1. GENERAL

The GOC 100 is a controller that allows the connection of the parallel printer I 51/C to the central processor units of the line 100, on the integrated printing channel.
The check of the printing operations is performed by the CPU and the controller provides the logic adaptation between CPU and DOE; on the contrary the operations of paper movement are fully controlled by the controller, as well as the immediate commands.

2. PERFORMANCE

In connection to a CPU of the 100 line, the performances are:

- Printing on 160 columns max.
- Max speed 640 lpm max.
- Possible use of two paper-transports
- Printing of either normal or CMC7 characters

3. PHYSICAL CONFIGURATION

The GOC 100 is contained in a standard SMN module.
The standard circuitry used is the SCL 1
The denomination of the lines is, up to down, A, B, C, D.
Requested supply voltage: + 20 VDC. The accuracy on the voltage is that one admitted by the standard SCL 1.

4. OPTION LIST

On the GOC 100 only one option is provided: the second paper transport. This option is made by adding some SCL 1 cards.

5. OPERATING ENVIRONMENT

Temperature and humidity shall never cause water condensation on the equipment.

For further details refer to "General design requirements for GEISI products" drawing ~~#~~ 300140030.

6.1. Description of the commands

The GOC 100 accepts the following commands:

- PRINT
- STAND BY
- Test almost-end-of paper 2nd transport
- Simple interline
- Double interline
- Triple interline
- Jump 1 with stop on the channel 1
- Jump 2 with stop on the channel 2
- Jump 3 with stop on the channel 3
- Jump 4 with stop on the channel 4
- Jump 5 with stop on the channel 5
- Jump 6 with stop on the channel 6
- Jump 7 with stop on the channel 7
- Set mode - Normal advance CMC 7 tape
- Set mode - Reduced advance CMC7 tape

COMMAND NAME	**COMMAND CODE**								**EXA CODE**
	07	06	05	04	03	02	01	00	
Print	O	I	O	O	O	O	I	O	4/2
Set STAND BY	I	O	I	O	I	I	O	O	A/C
Test AEoP 2end PT	I	I	I	O	O	O	I	I	E/3
Set mode red.	O	I	O	O	O	I	O	I	4/5
Set mode norm.	O	I	O	O	I	O	O	I	4/9
Semple interl.	T	O	O	O	I	O	I	O	0/A (6/A) *
Double interl.	T	I	O	I	I	O	O	I	5/9 (D/9) *
Triple interl.	T	I	O	I	I	O	I	O	5/A (D/A) *
Jump 1	T	I	O	I	O	O	O	I	5/1 (D/1) *
Jump 2	T	I	O	I	O	O	I	O	5/2 (D/2) *
Jump 3	T	I	O	I	O	O	I	I	5/3 (D/3) *
Jump 4	T	I	O	I	O	I	O	O	5/4 (D/4) *
Jump 5	T	I	O	I	O	I	O	I	5/5 (D/5) *
Jump 6	T	I	O	I	O	I	I	O	5/6 (D/6) *
Jump 7	T	I	O	I	O	I	I	I	5/7 (D/7) *

(*) The eigth bit (07) gives the chance to chose either the 1st or the 2nd paper-transport, accordingly to his value

T = 0 : 1st paper-transport; T = 1 2nd paper-transport

The decoding performed on the commands codes is partial and is made in such a way to avoid more than one command for the same code.

The decoding is showed in the following table:

COMMAND NAME	DECODED NAME		CODE								
	1stPT	2stPT	07	06	05	04	03	02	01	00	
PRINT	SETA	SETA	X	1	X	0	X	X	1	0	
Set STAND BY	POMI	POMI	X	0	X	0	X	1	X	X	
Test AEoP 2nd PT	SETE	SETE	X	1	X	0	X	X	1	1	
Set mode red.	DENO	DENO	X	1	X	0	X	1	0	X	
Set mode norm.	DEMA	DEMA	X	1	X	0	X	0	0	X	
Simple interl.	1IN1	1IN2	T	0	X	0	X	0	X	X	*
Double interl.	2IN1	2IN2	T	X	X	1	1	0	X	1	*
Triple interl.	3IN1	3IN2	T	X	X	1	1	0	X	0	*
Jump 1	DE11	DE12	T	X	X	1	0	0	0	X	*
Jump 2	DE12	DE22	T	X	X	1	0	0	1	0	*
Jump 3	DE13	DE23	T	X	X	1	0	0	1	1	*
Jump 4	DE14	DE24	T	X	X	1	X	1	0	0	*
Jump 5	DE15	DE25	T	X	X	1	X	1	0	1	*
Jump 6	DE16	DE26	T	X	X	1	X	1	1	0	*
Jump 7	DE17	DE27	T	X	X	1	X	1	1	1	*

(*) The eighth bit (07) gives the chance to chose either the 1st or the 2nd paper-transport, accordingly to is value:

T = 0 : 1st paper-transport; T = 1 : 2nd paper-transport.

6.2. Description of the program limitations

In connection to a CPU 115/1 it is not possible to use the second paper-transport.

6.3. State informatio.

The integrated interface ISI series 100 provides some wires on which the state informations of the subsystem are transmitted. In this paragraph these signals are described as well as the causes that set and reset them.

6.3.1. FUPON - Free printer

This signal, of electric level "0", signifies that the controller is free and therefore it is able to receive whatever command. It disappears at the reception of either a printing command (SETA) or a paper movement command (COM1N , COM2N).
This signal appears again for the following causes:

- End of the printing sequence (COIM)
- End of the paper movements (REFU)
- End of the phase tape advance in CMC7 (MEOC)
- When the signal FUSEN of out-of service appears (REMA)

6.3.2. FINOD - Printing end

It goes to electric level "1" when the print cannot be followed for any causes of out-of service.

6.3.3. FU22N - Printer in STAND BY

It goes to electric level "0" for the following causes:

- For a command from CPU
- By pushing on the button STAND BY
- For any reason that causes the signal out-of service"

It disappears pushing the OPERATE button if the causes that keep the subsystem out-of service do not subsist.

6.3.4. FIDAN - Almost - end - of - paper

This signal of electric level "0" can signalize to CPU either the appearance of almost-end-of-paper on the 1st transport during a paper movement on the 1st transport, or the appearance of almost-end-of-paper on the 2nd transport during a paper movement on the 2nd transport.
Normally (FF TECA in reset) FIDAN transmits to CPU the condition of the switch of almost-end-of-paper on the 1st transport (TESIN); only if it is requested by CPU with command "Test almost-end-of-paper on the 2nd transport" (decoded SETE, FF TECA in set condition), it is signalized to CPU the condition of the switch of almost-end-of-paper on the 2nd transport (TES2N).
The FF TECA is reset either by RESE (OR of the printing, set STAND BY and REMA commands) or by the appearance of whatever command of paper movement (COM1N, COM2N).
The signal does not interest the GOC 100, but it puts itself in inteface only as an inquirable condition from the program.

6.3.5. ERARC - Check error on photodisc

Sent from CPU to controller, it goes to electric level"1" when an error of check on the characters of the photodisc occurs. The signal ERARC does not interest in any way the GOC 100; its presence turns on the lamp "PRINT CHECK" on the command table.

6.3.6. SAFEN - End of sheet on the 1st. transport

This signal goes to electric level "0" when, during a paper movement on the 1st. transport, a hole on the 8th track of the loop is read (F018N) and it means end of sheet on the first transport.
This signal is reset either by a reading on the 7th track of the loop (F017N) or by an intervention of the time protection for the jumps duration or by every cause out-of-service except the broken paper and the end-of-paper (SARE).

6.3.7. SAFIN - End-of sheet 2nd transport

It goes to electric level "0" when, during a paper movement on the 2nd. transport, a hole on the 8th track of the loop is read (F028N) and it means end-of-sheet on the 2nd. transports.
This signal is reset either by a reading on the 7th. track of the loop (F027N) or by an intervention of the time protection for the jumps duration or by every cause of out-of - service except the broken paper and the end-of-paper (SARE).

6.3.8. FUSEN - Out-of-service

When at electric level"0", it means that the subsystem is out-of-service and indicates a misfunctioning.
It hinders any function of the subsystem.
It rises for the following causes:

- lack of ventilation
- subsystem in OFF
- either covers or printing group open
- intervention of the time protection on the jumps
- failure on the hammer-drive cards
- end-of-paper
- cyclic power supply that cannot finish the charge in the established time
- failure on the speed control of the roller
- intervention of the thermal protections
- end of the CMC7 tape
- lack of the loop with the button NO SKIP switched off.

This signal causes, when it appears, the reset af the whole subsystem. The FUSEN signal is reset by pushing the button OPERATE provided that the causes that had generate it have disappeared.

7. Operations theory

7.1. Description at general block diagram level

The GOC 100 is provided with two interfaces, one toward CPU and the other toward ATA 140.
Moreorer, it is provided with several logic blocks that are (see the general block diagram):

a) regeneration of signals from CPU

b) decoding of the commands and logic 1st paper transport

c) decoding of the commands and logic 2nd paper transport

d) decoding and staticization of the commands

e) logic of state

f) CI counter

g) counting logic CI

h) regeneration of the photodisc bits.

a) Regeneration of signals from CPU

The regeneration of signals from CPU includes all those circuits suitable for regeneration of the levels and cloks coming via cable.

b) Decoding of the commands and logic 1st paper transport

The decoding of the commands for paper movements on the 1st. transport is performed in a partial way.
These commands are the jumps and the interlines.
These commands are stored in appropriate registers and then conditioned before to be sent to the power circuitry on the DOE.

c) Decoding of the commands and logic 2nd paper transport

This part is identical to that one of the 1st. transport.

d) Decoding and staticization of the commands

The circuitry of decoding and staticization of the commands concerns the commands of print, test almost-end-of-paper, set STAND BY and set mode advance CMC7 tape.
Also in this case, the decoding is performed in partial wai and, while the command "SET STAND BY", after decoding, is sent to ATA, the other three commands are staticized in appropriate FF.

e) Logic of state

The logic of state concerns those circuits that condition the execution of the PRINT command; that enable the charge of the hammer-drive circuits and all that parts which arranges the interchange of state signals towart CPU. The signals are: FU22N, FINOD, FUSEN, FUPON, FIRUN.

f) CI counter

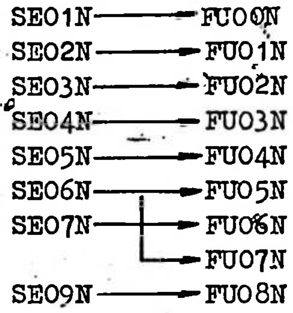
The CI counter is a binary, parallel counter which consists of 8 FF's and addresses the columns to be printed.

g) Counting logic CI

The counting logic CI comprehends all those circuits that enable a parallel counting. This part comprehends also the signal FINAN, formed by the decoded of the CI countor when it is at 158 value.

h) Regeneration of the photodisc bits

It comprehends all those circuits that regenerate the photodisc signals coming from ATA 140 before their sending to CPU.
That logic provides also the expansion of the photodisc code from 7 to 8 bits, as shown in the following table:



7.2. Description at intermediate block diagram level

Description of the interfaces.
For the integrated interface toward CPU see spec. 140248440 and for the interface GOC 100 - ATA 140 see the drawing 78A101868 on the PDS of the ATA 140.
The commands provided for the GOC 100 can be divided into two categories:

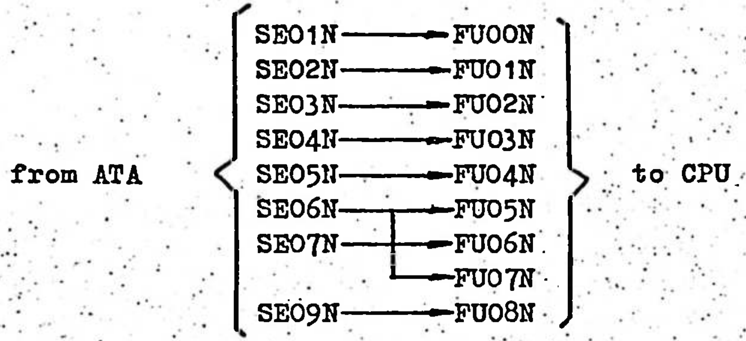
- The commands that occupy the channel because they need the controller besides the CPU;
- the commands that do non occupy the channel because they do not need any other phase besides the connetcion with the CPU.

In the first category there are the commands of print and those concerning the paper mevement (jumps and interlines on the first and second paper-transport).
To the second category belong the commands "set stand by", "test almost-end-of-paper 2nd transport" and the two commands of set mode advance of the CMC7 tape.

7.2.1. Description of the command PRINT

The command is sent by CPU to ATA with the signals RE00N + RE07N; it is decoded and clocked with TU01A (SETA), then it is staticized in the FF TACA; the appearance of SETA causes the reset of the FF UNDI and as a consequence the rise to electric level 1 of FUPON in the interface (signal of not disposable controller). If the limitation for the recovery of the printing modules (LIIM) of 18,7 msec is finished and if the ALI cyclic is not under charge (CARIN to electric

level 1), the FF COIM sets itself with the rising slope of DEPIN (CLOCK of the photodisc step).
To the following negative slope of DEPIN, the FU09N is put out toward CPU and the printing phase beginns.
The character of the photodisc code is sent by ATA 140 to GOC 100 through seven wires (signals SE01N ÷ SE07N) and it is expanded to eight (FU00N ÷ FU07N) as shown in the following table:



The rising slope of FU09 causes the reset of TACA.

In the CPU there is a strip of 162 positions; the first two positions are used by CPU to perform comparisons, the others 160 contain the characters to print; at the reception of the first FU09N, CPU staticizes in both the positions of lowest address the photodisc character present at that moment in interface, then it compares the first of these two characters with everyone of the 160 characters to be printed, proceeding through increasing addresses; for every examined position CPU emits toward the controller one clock (TU04N) if it has observed different comparison, it emits two clocks (TU04N, TU02N) if it has observed equal comparison.
The clocks TU04N make switch the column counter CI (which had been forced in the condition of all "1" by the positive slope of FU09); the first TU04N, moreover, sets the FF TACA (which is reset by the rise slope of FU09).
The clock TU02N, regenerated as CODIN, is sent to ATA 140 as shooting clock.
When CPU comes to examine the 159th character of the strip (counter CI at the value 158) the controller emits the signal FINAN which stops the sweep of CPU in the memory at the following character.

At this point CPU is waiting for another FU09N from the controller for taking up the sweep in the same way as made before, with this difference: that at the reception of the second FU09N (and at the reception of all the followings), the character of photodisc present in interface is staticized in the first position of the strip and compared first of all with the character present in the second position (that will always contain the code corresponding to the first FU09N sent by the controller); if the comparison is different CPU proceeds with the other 160 positions, if it is equal CPU stops the printing.
It shall be noted also that at the emission of every FU09 to CPU, and as far as the 64th FU09 included, the FF TACA resets and sets again when receives the first TU04 from CPU.
CPU comunicates to the controller the end of the printing sequence, not transmitting, in reply to the 65th FU09 received, any TU04 to the controller; this acts in such a way that the FF TACA remain in reset and it enable the positive slope of DEPIN to reset the FF COIM.
The reset of COIM causes: the inhibition to send any other FU09N to CPU, the transmission to the DOE of the signal "charge validation" VACAN at electric level 0; (this signal enables the cyclic power supply to charge the hammer-drives and it is present as long as the following print command); the set of the FF UNDI and then signalization toward CPU of disposable controller (FUPON to electric level "0"); the beginning of the limitations LIIM and LICA (LIIM is a signal which inhibits the print as long a 18.7 msec necessary for the recovery of the modules of the hammer-drive circuits; LICA is an inhibition for 2 msec to the paper-transport: in fact simultaneously to the reset of COIM, the signalization of disposable controller is emitted toward CPU, and the shooting command is given to the selected hammer for the print of the last character ; it is possible therefore, as soon as the controller becomes disposable, to accept a command of paper movement, but, before moving it, it is necessary to wait till the hammers have hit the paper; LIIM has been introduced for this purpose, taking into account the delay caused by the univibrator of alignment and the free fly time of the hammers.

7.2.2. Description of the commands of paper movement

These commands are distinguished in interline commands and

jump commands on the 1st or on the 2nd transport.
Logically the commands are executed in the same way, either the commands concerning the 1st transport or those concerning the second transport.
In order to simplify, the operation of the equipment will be referred to the first transport.
The interline commands are three: simple interline, double interline and triple interline, which decoded and clocked respectively are called 1IN1, 2IN1 and 3IN1.
These decoded are staticized in a suitable shift register of three FF. The last FF of the register (1NI1) is that one which directs the signal MOCIN that goes into the DOE to command the power circuits of the brake and the clutch.
If the controller receives a triple interline command the FF IN13 is set, it, by propagation, sets also the FFs IN12 and IN11 and resets the FF UNDI which forces to level "1" FUPON taking away the condition of disposable unit.
IN11, if the limitations for the recovery of the power circuits of the last paper movement (MONI) have finished, and if 2 msec are spent from the end of the print (LICA), forces MOCIN, at zero, ordering the power circuits of the paper transport in the DOE.
A photodisc is rigidly connected to the small shaft which makes turn the transports; it, at every interline step, emits an interline clock (TI1ON).
The interlines register, at every clock received from the controller, shifts of a position, i.e;: the FF IN13 resets at the first TI1ON and the FFs IN12 and IN11 remain set.
IN12 resets at the 2nd TI1ON and IN11, at last, resets at the 3rd interline clock, then the command of the clutch to the DOE (MOCIN = 1) is taken away and the paper movement is finished.
The same happens in case of double interline in which only the FF IN12 and IN11 set (they reset with two interline clocks) and in case of simple interline when only IN11 sets and resets at the first TI1ON received.
Whit the fall to "0" of MOCI the limitation MONI = 1 of 22 msec is actuate and the controller is freed by resetting the FF UNDI after 1 msec.
This waiting of 1 msec to get the unit free has been actuated in order to be sure to perform the following print on fixed paper.
The jump commands utilize a suitable register SA

The command coming from CPU is decoded, strobed (DE11 if jump 1.... DE17 if jump 7) and staticized in the relative FF of the SA register (SA11 if jump 1.... SA17 if jump 7); COMIN goes tc zero and MOCIN follows it provided that the limitations MONI and LICA are finished; the fall to zero of the COMIN causes the reset of UNDI too, replacing the condition of disposable unit.

At the clutch shoot, the TI1ON begin to reach the controller from the paper-movement photodisc; they are sent in mask to all the FF of the register SA of the jumps; when the loop hole , related to the commanded jump, comes under light (FO11N if jump 1.... FO17N if jump 7) the clock TI1ON finds the mask able and causes the reset of the FF, set a little before, making the jump to finish; MOCIN infact rises to "1" again and takes away the command from the clutch; it starts the limitation MONI (22 msec to the next paper movement) it makes the controller to become free again (UNDI in set, FUPON to electric level zero) after 1 msec.

It shall be noted that the jump 7 with stop on the channel 7 can be manually executed by phusing, on the operating table, the push-button PAPER1, the pressure on the push-button PAPER1 causes the fall to zero of the signal COSIN in the interface from DOE toward controller; if the printer is in STAND BY (FU22A to electric level zero) PAGIN falls to zero and sets the FF SA17, starting the jump; the reset, and then the end of the jump, occurs at the appearance of the negative slope of TI1ON with FO17N to electric level zero, analogously to what described a little above for the jump seven commanded by CPU.

It shall be noted also that, by pushing the button NO SKIP 1 on the operating table it is also possible to transform all the programmed jumps into simple interlines (we always refer to the operation of the logic related to the first transport).

The pressure of NO SKIP 1 in the command table takes to electric level "O" the signal NOSIN in interface, enabling the passage of all the interline clocks TI1ON, in this manner to every interline step there will be a general reset of the SA register by the signal ORSI.

The controller provides to the CPU signalizations of end-of-sheet or beginning-of-sheet through the FF FIMI.

The FF FIMI sets every time the loop relative to the 1st transport shows a hole on the track 8 (end-of-sheet) and it resets to the appearance of a hole on the track 7 (beginning-o-sheet).

The logic of the paper movement for the second transport is entirely equal to that one of the first transport: the FF's of the interline register are IN21, IN22, IN23, the clock from the jumps photodisc is TI2ON, the limitation, for the recovery of the power circuits is MON2N, the register of the coded jumps is SA21 ÷ SA27, the command to the clutches is MOC21, the buttons of the command table are PAPER2 and NO SKIP 2, the signalization end/beginning-of-sheet is FIM2.
In the controller there is provided a time-check on the duration of the jumps, common to the two paper movements.
This check, of two seconds, is executed in the following way : the signal MOCIA, which when the paper movements are not executed is to electric level 1, always keep to "1" DUSI.
If MOCIA goes to electric level zero, it makes the internal circuit of the board ULUN to univibrate, and if within two seconds MOCIA does not rise again, indicating that the jump is finished, DUSI goes to electric level "0"; as a consequence it is sent to DOE the signalization MASEN (to electric level zero) and the subsystem is set out-of-service (it shall be noted that MASEN is generated by RESI, which starts with the OR of DUSI relative to the first transport and of DUS2 relative to the second transport and with generation equal to that one of DUSI.
In case of out-of-service for any cause, except the end-of-paper or the broken-paper, the DOE sends to the controller the signal RESAN to electric level zero; RESAN in OR with the clear from CPU (REGEN) forms the signal SARE which resets the interlines registers for the 1st and 2nd transport, as well as the FF FIMI and FIM2. SARE, in OR with INSI, generates the signal ORSI, which causes the reset of the code jump registers relative to the first and the second transport. The reason for which the jumps or interline registers are not reset in case of out-of-service for broken-paper or end-of-paper is to have the possibility to perform manual jumps pushing the buttons on the operative table PAPER1 and PAPER2.
As we have seen, to the arrival of a paper movement command, the controller takes away the disposable condition toward CPU. In fact the FF UNDI sets with the OR of the paper movements commands and resets with the and of the two paper movements and. Since it is possible to make paper movements at the same time , the paper movement ordered as the 2nd in time, must be ordered from software without waiting for disposable unit.

7.2.3. Description of the command "Set manual"

The command is decoded and clocked forming the signal POMI which is regenerated and sent to DOE as SESEN to be staticized. The information of device in manual state is sent, back from DOE, to the controller which regenerates and sends it to CPU as FU22N.

7.2.4. Description of the command "Test almost-end-of-paper 2nd transport"

The controller receives from DOE the signals TESIN and TES2N which refer the state of the microswitch of almost-end-of-paper respectively of the 1st and the 2nd transport.
Normally (FF TECA in reset) FIDAN transmits to CPU the condition of the microswitch almost-end-of-paper on the 1st transport (TESIN), only when it is requested by CPU with the command "Test almost-end-of-paper 2nd transport" (decoded SETE, FF TECA in set) the switch condition referred to the 2nd transport (TES2N) is signalized to CPU.
The FF TECA resets either with RESE (OR of the printing command, the SET STAND BY and REMA commands) or with the appearance of any paper movement command (COMIN, COM2N).

7.2.5. Description of the command "Set mode normal advance CMC7 tape"

It is decoded and clocked (DEMA) and causes the set of the FF CAMA; in the interface toward DOE NOAVN goes to electric level "1".

7.2.6. Description of the command "Set mode reduced advance CMC7 tape"

It is decoded and clocked (DENO) and causes the reset of the FF CAMA.
In the interface toward DOE NOAVN goes to electric level zero.

CROSS REFERENCE . BETWEEN NORMAL ROLLER CHARACTERS AND INTERNAL

CODE GECD

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0					0	SPAZIO					↑	+					0000
1					1	A					J	/					0001
2					2	B					K	S					0010
3					3	C					L	T					0011
4					4	D					M	U					0100
5					5	E					N	V					0101
6					6	F					O	W					0110
7					7	G					P	X					0111
8					8	H					Q	Y					1000
9					9	I					R	Z					1001
A					[	&					–	←					1010
B					#	.					$	,					1011
C					@	]					*	%					1100
D					:	(					)	=					1101
E					>	<					;	"					1110
F					?	\					'	!				ƀ	1111
	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111	

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CROSS REFERENCE BETWEEN CMC7 ROLLER CHARACTERS AND INTERNAL CODE GECD

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0					0	SPAZIO					8CMC7	1CMC7					0000
1					1	A					J	/					0001
2					2	B					K	S					0010
3					3	C					L	T					0011
4					4	D					M	U					0100
5					5	E					N	V					0101
6					6	F					O	W					0110
7					7	G					P	X					0111
8					8	H					Q	Y					1000
9					9	I					R	Z					1001
A					[	SS3					–	9CMC7					1010
B					#	.					$	,					1011
C					@	]					*	%					1100
D					2CMC7	SS5					0CMC7	5CMC7					1101
E					6CMC7	4CMC7					3CMC7	SS2					1110
F					7CMC7	\					SS4	SS1				ƀ	1111
	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1011	1100	1100	1101	1110	1111	

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1. GENERAL CHARACTERISTICS

1.1. General

The GOC 200 is a controller with buffer which allows the connection of the printer I 51 C to the CPU's of the series GE 100.
The controller performs the functions of operations check and logic adaptation between CPU and DOE.
It accepts from CPU commands and data; there are then two dialogues between CPU and controller:

a) - sending of immediate effectiveness command (set mode)

b) - sending of a command which involves characters transfer.

In the first case the operation stops at the reception of the command, presetting the interested devices (manual set, set normal advance); in the second one, instead, the command reception starts the phase of information change.
The string of characters sent from CPU is so composed:

A	B	C_1		C_n

A : it specifies the paper movement to be performed on the 2nd transport.

B : it specifies the paper movement to be performed on the 1st transport.

$C_1 \div C_n$: characters, in code GECD, of the line to be printed. The max number of characters to print in a line is depending upon the subsystem configuration and it is anyway never over 160.
See the enclosed tables for the codes related to the characters either normal either CMC7.
When the characters exchange is over, the controller performs off-line the preset operations, i.e. it starts first of all the eventual paper movements and, at the end of the longest one, it starts the printing phase.
At the end of the printing, the controller becomes

available again and in interface there are the information related to the performed operations.

1.2. Performances

The GOC 200 operates, connected to CPU's of the 100 line, the following performances :

- printing OFF-LINE on a max of 160 columns,
- paper movement on one or two transports,
- printing of either normal or CMC7 characters up to a max of 1100 lpm.

1.3. Physical configuration

The GOC 200 is realized on six lines contained in one and a half module of the standard SMN.
The GOC 200 is realized with SCL 1 boards.
The lines are called A,B,C,D,E,F, downwards.

2. REQUESTED ENVIRONMENTAL CONDITIONS

Temperature and humidity shall never cause water condensation on the equipments.
For further details refer to: "General design requirements for GEISI products" ~~#~~ 300140030.

3. OPTIONS LIST

On the GOC 200 only one option is provided: the 2nd paper transport.
This option called OPZ 201 can be added in field with the insertion of some boards.

4.1. Commands description

The GOC 200 accepts and executes the following commands:

- set mode normal advance CMC7 ribbon
- set mode reduced advance CMC7 ribbon
- data transfer from CPU
- set STAND-BY

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The decoding performed on the commands codes is partial and it is indicated in the following table.

l	g	f	e	d	c	b	a	COMMAND	DECOD.
X	X	X	X	X	X	1	0	DATA TRANSF.	DETA
X	X	X	0	1	0	X	X	SET NORM.ADV.	DEMA
X	X	X	0	0	1	X	X	SET RED.ADV.	DENO
X	X	X	0	1	1	X	X	SET STAND-BY	COPE

It is possible to send with only a code the commands of either set normal advance and data transfer, or set reduced advance data transfer; if with only one code the set STAND-BY and data transfer commands are given, it is only accepted the first of those.

It has to be noted that in this case the CPU remains blocked in the instruction execution, because there is an inconsistency between the character Z (transfer) and the character X (set mode command). The command codes will have to be those listed in the following table.

l	g	f	e	d	c	b	a	
0	1	0	0	0	0	1	0	PRINTING (1)
0	1	0	0	0	1	1	0	RED.ADV.PRINTING (2)
0	1	0	0	1	0	1	0	NORM.ADV.PRINTING (2
0	0	0	0	0	1	0	1	SET REDUC. ADVANCE(2
0	0	0	0	1	0	0	1	SET NORMAL ADVANCE(2
0	0	0	0	1	1	1	1	OPERATOR CALL

(1) This command does not change the set mode advance ribbon.

(2) The commands have a signification only if the printer is set for CMC7, on the contrary the inked ribbon advance is not affected by these commands.

4.2. Program limitations description

The GOC 200 is not provided for the connection to CPU 115/1.

4.3. Status information

The standard ISI series 100 interface provides a well defined number of leads reserved to status information transmission referred to the connected s/s. In this paragraph all these signals will be described one by one indicating the causes that make them to arise and to disappear.

4.3.1. PE00 - Availability

This signal at electric level 0V is to indicate that the GOC 200 is not engaged in any operation (free unit).
In the GOC 200 this signal goes to electric level +5V at the reception of a data transfer command from CPU, if the command is accepted by the GOC 200.
The availability signal reappears:

- at the printing operations end (VACAB)
- at the paper movement end without any printing (SESA/COSA)
- at the arrival of the signal FINU transfer end from CPU, if there has been a check error on the received characters (REOC)
- at the arising of an out-of-service (CAGU 2).

4.3.2. CAPE

The signal CAPE (electric level 0) can appear for the following causes:

a) at the reception of a command which is rejected for:
   - unknown command (ORCO)
   - check error on the command codes (CEUC)

- command sent to controller either occupied or in manual state (RICO).

The signals ORCO, CEUC, and RICO are timed with TECON.

b) for the presence, among the received data, of characters with the bit "f" ≠ "1" COBI (from this control they are excluded the first two characters related to the paper movements recognized from the signal PEDI).

The signal COBI is timed by TIFAN (strobe characters)

c) in case of a printing that has not been finished in a drum revolution (VACAB with FITA).

The signal CAPE is reset by the following command (REER). The signal is significant with free controller (PEOO at OV; except the case b).

4.3.3. ERCA

This signal goes to electrical level O V when a check error is revealed either on the character codes or on the command received from CPU.
The signal can appear in any moment during the transfer from CPU (CAER).
In such case, at the transfer end, the channel becomes free annulling the eventual printing and paper movement.
The signal ERCA is reset by the following command (REER).
The signal is significant when the controller is free (PEOO at OV)

4.3.4. SEGE

This signal goes to electrical level OV when a check error has occurred either on the codes transmitted by photodisc (SERA) or on the characters read by the memory buffer (UNER).
These checks are performed during the printing phase (USBA); the signal is significant with free controller (PEOO at OV).

The signal SEGE is reset by the following command of data transfer (SETA).

4.3.5. FISE (end-of-sheet from loop 1st transport)

This signal goes to electric level 0V when, during a paper movement on the 1st transport, a punch is found on the 8th track of the loop (F018N) and it means end-of-sheet on the 1st transport.
Such signal is reset:

- by finding of a punch on the 7th track of the loop (F017N),
- by the arising of an out-of-service (CAGU2),
- by an intervention of the time protection on the jumps.

4.3.6. EGOL (end-of-sheet from loop 2nd transport)

This signal goes to electric level 0V when, during a paper movement on the 2nd transport, a punch is found on the 8th track of the loop (F028N) and it means end-of-sheet on the 2nd transport.
Such signal is reset:

- by finding of a punch on the 7th track of the loop (F027N),
- by an out-of-service (CAGU2),
- by an intervention of the time protection on the jumps.

4.3.7. SECO

This signal, when at electric level 0V, indicates that the equipment is in manual status
It appears:

- depressing the button STAND-BY on the I 51 operating panel

- at the arising of an out-of-service (MARE) .
- sending the suitable command set STAND-BY from CPU.

The signal SECO is reset by the pressure on the button OPERATE if the causes of out-of-service have disappeared (MARE).
The signal causes the turning on of the light STAND-BY on the operating panel of the I 51 III.

4.3.8. MARE

This signal means subsystem out-of-service and indicates a serious malfunction, such as to hinder any subsystem operation.
In the GOC 200 in particular the signal can be due to the intervention of the time protections on the jumps.
The signal MARE causes, when it appears, the reset of the whole subsystem except the error signals.
The MARE signal is reset by pushing on the button OPERATE if the causes that have generated it have been eliminated.
For all the other causes of out-of-service, see the PDS ATA 140.

4.3.9. TESE (Almost-end-of-paper 1st transport)

This signal goes to electric level 0V when, during a paper movement on the 1st transport, the switch of almost-end-of-paper 1st transport is energized .
The signal does not interest the GOC 200 and it is used as a condition to be checked by the program.
The signal is reset by the pressure of the button OPERATE if the switch action has disappeared.

4.3.10. NU10 (Almost-end-of-paper 2nd transport)

This signal goes to electric level 0V when, during a paper movement on the 2nd transport, the switch of almost-end-of-paper 2nd transport is energized. The signal does not interest the GOC 200 and it is used as a condition to be checked by the program. The signal is reset by pressure of the button OPERATE if the switch action has disappeared.

4.3.11. NU20

This signal, at electric level OV, indicates the condition of"printer preset for the normal printing" in the subsystems suitable to print CMC7 characters.

5. FAILURE DIAGNOSIS

5.1. Diagnostic programs list

These documents will be called out in the subsystems PDS.

6. OPERATIONS THEORY

6.1. Description at general blocks diagram level

The GOC 200 is provided with 3 interfaces which connect it respectively to CPU, to the memory buffer (MEM 170) and to the DOE.(ATA 140).

The GOC 200 are besides includes some logic blocks which, with reference to general blocks diagram (drawing ~~##~~ 78B100572) are:

- timing logic
- commands decoding and storage logic
- errors and conditions logic
- 1st and 2nd paper movement logic
- buffer driving logic
- columns and memory addresser counter
- cycle counter

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- stroke counter
- buffer and photodisc character comparer
- photodisc character register
- RE register (hammers recovery)

6.1.1. Timing logic

It comprehends all the logic networks which control the interface pulses and various operations performed by the controller during the buffer loading, paper movement, printing phases.

6.1.2. Command decoding and storage logic

It is performed by the networks which recognise, check and execute the coded commands (DEIN, DETA, FINU etc.) coming from CPU.

6.1.3. Errors and conditions logic

It is composed by the networks which generate all the signals of the ISI interface described in the paragraph 4.3.
These signals, continuously defining the equipment status allow to know the status itself interpreting and signaling the eventual errors.

6.1.4. 1st and 2nd paper movement logic

It is composed by a common part:

- the decoded of the paper movement commands,
- the occupied-mechanic signal MOCA
- the reset of the storage registers for the jumps and the spacing (REOC)
- conditioning of the enabling paper movement start at the transfer end (FASAN)

- paper movements inhibition as long as 2.5 msec to allow the printing of the last character with standing paper (LICA).

and by two analogue parts; they comprehend respectively:

- commands storage register (IN..., SA...)
- conditioning circuits for the clutches recovery (MON1, MON2)
- time-control circuits on the jump duration (RES1, RES2)
- end-of-sheet signal (FISE, EGOL)
- power actuators command logic (MOC1, MOC2)
- pulses for the jumps and spacings register load (CA01, CA02)

6.1.5. Buffer driving logic

It comprehends the networks which perform:

- writing in the memory buffer of the characters received from CPU
- figures completion for transfers from CPU less than 162 characters
- reading in continuous cycle of the characters of the printing lines.

6.1.6. Columns and memory addresser counter

The addresser register for the memory and columns (CI01 ÷ CI08) is a parallel counter of 8 FF's which successively addresses the various memory positions and then also the decoding network of the printing columns.
The counting pulse (TE02N) of the register is provided from the buffer memory timing such as the

count occurs 0.5 µsec before the end of the timing cycle which is 4 µsec long

6.1.7. Cycle counter

It is a serial counter of 6 FF's (CL01 ÷ CL06). This counter is used to count the photodisc points read during the printing as such as to verify the printing phase duration; that as maximum, will be of a complete drum revolution.
Otherwise the signal CAPE appears (paragraph 4.3.2) and the cycle counter will provide to free the controller.

6.1.8. Stroke counter

It is a serial counter of 8 FF's (BA01 ÷ BA08). The purpose of this counter is to perform the consecutive printing of a set of 43 characters and an interline within a drum revolution.
This performance is obtained by counting all the spaces (DEFI) which are loaded in the buffer memory as well as the printing orders (CODI) which are, time after time, given to the DOE; clearly as soon as the counter reaches the value 160 the printing is over.

6.1.9. Comparer

The comparer (01PA ÷ 14PA) is a logic network which performs, in the printing phase, the comparison among the photodisc character as soon as read (01FO ÷ 08FO) and the characters of the printing line contained in the buffer (ME01 ÷ ME07).
In case of equality in the comparison it will be given a printing order (CODIN) related to the examined printing column and a counting pulse (CODI) to the stroke counter.

ST

6.1.10. Photodisc character register

It is a register of 8 FF's (01FO ÷ 08FO) which stores the photodisc characters while they are read.
The loading is timed by the photodisc clock (DEPIA).
It is warranted that among the photodisc register loading and the sweep beginning of the buffer line there is a time of 10 usec for the hammers driving boards stabilization.
That is obtained triggering the memory sweep (TE00) with the signal RERI which appears 10 usec after the DEPIA start in the printing phase (USBA).

6.1.11. RE register

It is a serial counter composed by 5 FF's.
It is utilized to count the steps necessary to guarantee that the hammers have recovered after a printing.
The counting pulse is the photodisc clock (DEPIN) conditioned by the FF ATMA which identifies the hammers recovery phase.

6.2. Functions and performance description at intermediate block diagram level

The commands provided for the GOC 200 can be divided into two categories:

a) commands engaging the channel as they provide the controller engagement besides the connection with the CPU;

b) commands not engaging the channel: they do not provide any other phase besides the connection to CPU.

In the first category there is the data transfer command which provides the actuation of the paper movement and of the printings as soon as the connection with the CPU is finished.

In the second category there are all the other commands, i.e.:

- set STAND-BY command
- set normal advance CMC7 ribbon command
- set reduced advance CMC7 ribbon command

For all the rejected commands a type b sequence will exist. This initial division has been made to better understand why a double description is made below; which is referred to the two command types as above delineated.

6.2.1. Functional description of the commands not engaging the channel

The commands classified as type b in the preceeding paragraph belong to this kind; these commands are characterized as those requiring only a code transfer from CPU (the command).
The command execution occurs according to the timing indicated in the timing chart # 78B100573 sheet 3.
The reception of the commands set manual, set reduced advance CMC7 or normal ribbon is performed according to the following sequence: reception of the channel selection signal PU00, reception of the TU20 related to the command code which triggers the univibrator TU00 as long as 2 usec; this has the object to introduce a sufficient delay to guarantee the various decoded stabilization.
The univibrator TU00 falling triggers the univibrator TU02 which is the true TU20 for the GOC 200. With this signal, many things are made as function of the various commands received; more precisely:

a) in case of set STAND-BY command (COPE) a pulse

(SESEN) is sent to ATA 140 causing the set of the FF manual.

b) In case of set mode normal advance CMC7 ribbon command (DEMA) the FF CAMA sets; it is utilized to provide to ATA 140 with the signal NOAVN; it will make to advance the ribbon in CMC7 mode (i.e. as such as to hit always on the new ribbon zone) it must be noted that if the s/s is not preset for the CMC7 printing, there will be present the signal SAMA (MSW on the mechanic) which will keep in continuous reset the FF CAMA; in this case there will not be the command reject signal.

c) In case of set mode reduced advance CMC7 ribbon command (DENO) the FF CAMA is reset.
The transmission command sequence in all cases ends with the sending to CPU of TE30 (received command) which appears with the 2nd TU02 slope. The commands in facts are timed to the signal TECON which corresponds to the 1st TU02 edge.

6.2.2. Functional description of the command rejection

The GOC 200 rejects the commands if the signal INCO is at electric level +5V.
The reasons for the rejection are the following :

a) unknown command (ORCO)

b) check error (GEUC)

c) command reception with s/s in manual status (FU22A)

d) busy subsystem (UNOCN)

The signal RICO, due to the conditions c), d) appears at the arrival of the signal TU20 from CPU if there are transmission commands (VICU).
The FF RICO reset occurs with the 1st edge of TE30, i.e. at the command transmission sequence end.

The signalization INCO appears with the TU20, thus before the commands strobe (TECON), which will not be accepted.
With the signal INCON the FF ERCO sets and the signal [illegible] CAPE sent to CPU signals [illegible] a command error.
The FF ERCO is reset by the following command (REER).

6.2.3. Functional description of the transfer command

The data transfer command is composed by some phases; they are:

1 - printing command transmission
2 - characters transmission
3 - complement to 160 of the printing line
4 - paper movements execution
5 - printing execution
6 - hammers recovery

The phases above indicated come in the indicated order, the phases 3,4,5, could either exist or lack; the phases 3 and 4, if both presents, will be started at the same time.
All the five phases above indicated will be deeply described in the following paragraphs.

6.2.3.1. Description of the command transmission phase

The transmission phase of a printing command (DETA) is completely similar to the reception phase of the other commands described in the paragraph 6.2.1.
The phase begins with the reception of the channel selection signal (signal PUOO low) and of the strobe TU20 related to the command code.
The TU20 will cause the arisal of the signal TUOO which has the purpose to guarantee the output stabilization of the networks commanded by the interface signals AIFU + MIFU; the 2nd TUO2 edge will get the FF TACA set.

The signal of received command (TE30) will be transmitted at the 2nd TU02 edge..
If the command were sent either with the subsystem in manual status, or with busy subsystem, or if the check error appears, or the command were unknown, it will be rejected and the FF TACA will not set.
The signal TU02 (SETA1) related to the command code causes the going to the configuration 254 of the register CIO and the reset of the stroke and cycle counter.
The signal TACAN delayed of 3 usec (RERI) starts the 1st character request TE10. The delay is necessary to be sure that the TE10 goes out after the TE30.

6.2.3.2. Description of the character transmission phase

This phase follows the reception and acceptance of the transfer characters command.
It provides the transmission from a minimum of 1 to a maximum of 162 characters.
The transmission phase execution occurs according to the timing indicated in the timing chart drwg. # 78B100573 sheets 4,6,7.
The phase beginning occurs at the emission, from the GOC 200, of the 1st TE10 which comes 3 usec after the FF TACA set. During this phase, a cycle as described below is repeated N (1 ≤ N ≤ 162) times (where N is the number of characters sent from CPU).
At the arrival of a TU20 related to the character transmitted by CPU, the signal TU00 will be produced by TU20 and at the 2nd edge will cause the signal TU02 to appear.
With this signal the following controls are made:

- check control (if there is an error the FF ERCA will be set)
- equality control of the bits "f" and "1" (in case of unequality the FF ERCO sets with the sign-

al CACO)

- register ME loading in the MEM 170 (TIFAN)
- start of the internal timing of the MEM 170 with the signal TE00 commanded by TIFA.

The characters received by CP will be at 8 bits with oddparity check, they will be compressed into characters at 7 bits with parity check according to the following law:

AIFU ------> ME01
BIFU ------> ME02
CIFU ------> ME03
DIFU ------> ME04
EIFU ------> ME05
FIFU ------> ME06
GIFU ------> ME07
LIFU, MIFU } $\text{LIFU.MIFU} + \overline{\text{LIFU}}.\overline{\text{MIFU}}$ --> ME08 (check)

The 2nd TU02 edge will cause the start of the signal "received" (TE30) which will authorize the CP to get ready the following character.
The writing cycle is as long as 4 usec and after about 2 usec a signal (TE02N) is emitted, this, with its 2nd edge , makes the TE10 (VI01) to start in order to require a new character from CP.
The VI01 that goes out about 0.5 usec before the timing cycle end of the MEM 170 makes besides the addresser register CI0 to count.
This cycle is repeated for every character transferred from the CP to the GOC 200.
The first two characters transferred by CP are the paper movement commands and more precisely the first character (position 254) will be the command for the 2nd transport, while the 2nd character (position 255) will be the command for the 1st transport.

The paper movement commands decoded are partial but realized in such a way to make impossible the presence of more than a command at a time. These decoded are showed in the following table:

l	g	f	e	d	c	b	a	COMMAND	DECODED
		0				0	1	SINGLE INTERLINE	DEIN
		0				1	0	DOUBLE INTERLINE	DOIN
		0				1	1	TRIPLE INTERLINE	TRIN
		1	0	0	1			JUMP TO TRACK 1	01SA
		1	0	1	0			JUMP TO TRACK 2	02SA
		1	0	1	1			JUMP TO TRACK 3	03SA
		1	1	0	0			JUMP TO TRACK 4	04SA
		1	1	0	1			JUMP TO TRACK 5	05SA
		1	1	1	0			JUMP TO TRACK 6	06SA
		1	1	1	1			JUMP TO TRACK 7	07SA

Any other code not listed in the table above is interpreted as a no paper movement command.

The command codes shall anyway be the following :

l	g	f	e	d	c	b	a	
0	0	0	0	0	0	0	0	NO MOVEMENT
0	0	0	0	0	0	0	1	SINGLE INTERLINE
0	0	0	0	0	0	1	0	DOUBLE INTERLINE
0	0	0	0	0	0	1	1	TRIPLE INTERLINE
0	0	1	0	0	1	0	0	JUMP 1
0	0	1	0	1	0	0	0	JUMP 2
0	0	1	0	1	1	0	0	JUMP 3
0	0	1	1	0	0	0	0	JUMP 4
0	0	1	1	0	1	0	0	JUMP 5
0	0	1	1	1	0	0	0	JUMP 6
0	0	1	1	1	1	0	0	JUMP 7

The reception cycle of these first two characters will be similar to that of all the others, but it will comprehend an ulterior phase which is performed at the same time as the ME register loading and is the loading of the two paper movements registers.
The loading of the register related to the 1st and 2nd storing circuit is timed respectively by the pulses CA01N and CA02N.
These pulses are decoded in the positions 255 (PEDIN - C101A) and 254 (PEDIN - C1011) of the buffer.

The loading will be different whether it is a loop controlled jump or an interline photodisc controlled jump.

In the 1st case it will be set, among the 7 FF's, one which will be reset as soon as a punch will be found on the track of the loop selected by the command.

In the second case, one, two or three FF's (respectively for single, double and triple interlines) will be set, then performing a shift forth of zero commanded by the interline photodisc.

The end of the character transmission phase happens in two different ways whether the number N of transferred from CPU characters is less of 162 or more/equal to 162.

In the 1st case ($N < 162$) the CP after the reception of the TE30 related to the last character, will transmit the signal FINU with the TU20. It will appear then the signal TISO which, with its 1st edge, , will reset the FF TACA.

The first edge of TISO will set also the FF TIBE (if ERCA) which through the univibrator RERI will start the buffer complement phase.

In the 2nd case ($N \geq 162$) the FF FINE set will occur with the 1st edge of the TU02 of the 162nd character; the CP, received the TE30 of the same character, emits the signal FINU with the accompanying TU20, the so generated TISO will cause on the 1st edge the FF TACA reset.

On the 2nd edge of TISO the reset of the FF FINE will occur.

If a check error on the transferred data happened, (FF ERCA set) the jumps registers (REOC) reset on the 1st edge of TISO and the signal PE00 reappears in interface.

With the address 159 decoded, i.e. during the last character writing, the signal RECI appears, timed with TE02N.

This signal forces the memory addresser C10 into the "0" configuration, i.e. at the address from which the buffer sweep shall start.

6.2.3.3. Description of complement to 160 of the printing lines phase

This phase is started by the FF FIBE set, which is determined by the 1st edge of the signal TISO if the CP transmitted a characters number less than 162 and if there have not been check errors on them ($\overline{\text{ERCA}}$).
The set edge of this FF triggers the univibrator RERI which, 10 usec after, starts the internal timing of the MEM 170 generating the signal TECO.
The FF TIBE besides forces to 0V the signal FIBEA and to +5V the signal CORI.
In these conditions there is the internal timing recycle of the MEM 170 while the memory positions, until the 162nd (address 159) are set at zero level.
To every memory cycle, a counting forth way is made on the stroke counter (BA01 + 8) with the signal RIFI.
The stroke counter had already counted during the phase of characters transfer from CPU to buffer, all the spaces (signal TIFI). The eventual spaces in position 254, 255 are not counted (signal PEDI).
This phase end is obtained acting on the signal CORI which is lowered with the 1st signal TE02N edge related to the cycles made at the memory address 159 (i.e. to 162nd cycle of the MEM 170 internal timing).
The same signal (R160) causes with its 2nd edge the FF FIBE reset while, at the 162nd cycle end from the MEM 170 timing, forces the addresser CIO (signal RECI) in the configuration "0" and i.e. to the address from which the 1st buffer sweep shall start.

6.2.3.4. Description of the paper movement execution phase

The paper movement phase is preceded by the loading phase of the paper movement registers as described in the paragraph 6.2.3.2.
The effective beginning of the paper movement is

determined by the reset of the FF FASAN, produced by the 2nd edge of the signal TISO (FINU.TU20). The FF FASA has been set with the commands sending of data transfer, to time the paper movement start. In case there have been some check errors on the data received by CP we shall have the reset of the paper movements register with the 1st TISO edge.. With the FF FASAN reset already called out above, if there are not running recoveries of the paper movements (MON1 for the 1st and MON2 for the 2nd transport) and if 2.5 msec have already expired since the last command of the power circuits (LICA) there will be the effective command of the functions (MOC1N for the 1st and MOC2N for the 2nd transport).
In the clutches command, a 5 msec protection is enabled which, with its presence, hinders the acceptance of the "Top interligne" signals (TI1ON for the 1st and TI2ON for the 2nd transport); this protection, falling, will have enabled that signal emission and the various operations inside of the paper controller logic.
At this time, two paper movements types will have to be distinguished:

1) - single, double, triple interline

2) - jump controlled by a loop track

In case of paper movements (type 1) the signal emitted from the "Top interligne" disc will be utilized to perform a shift forth wise of "0" either in the register IN11-IN12-IN13 or in the register IN21-IN22-IN23.
The jump will be considered over when the three FF's which compose either the one or the other register are at zero.
In case of a type 2 paper movement there will be the reset of the FF in set either in the register SA11 ÷ SA17 or in the register SA21 ÷ SA27 when there is, at the reading of a "Top interligne", the reading of a punch presence on the selected part of the loop.

The jump end triggers the start of the timing network of the clutches recovery (DEM1-MON1N and DEM2-MON2N) which inhibits the paper movements start as long as 15 msec after the end of every jump.
At every jump start, there is the start of the duration check on the jumps.
This control is performed as to verify that the jump duration is less than ∼2 sec (which guarantee the reading of a loop corresponding to the highest provided module and to the lowest speed of jump). In case that we have a jump with duration more than ∼2 sec, a signal is generated which causes the reset of the jump registers REIN or RAIN sending to ATA 140 a set pulse MARE (MASEA).
The jumps registers are reset also by the signal NOS1 or NOS2.
Therefore with the button NO SKIP depressed the machine executes an interline instead of a jump.
Pushing on the PAPER button, if the equipment is in manual status (SECOA) and if it is not engaged, (UNOC) the FF related to the track 7 sets with COS1N or COS2N. The jump stop occurs as for the programmed jumps.
The FF MOCA, which sets with the commands to the functions (COM1N - COM2N) at the end of the transfer (TARAN) inhibits the printing phase start as long as it is not reset.

6.2.3.5. Functional description of the printing phase

The printing phase is preceded by the charges inhibition to the hammer-drivers from the cyclic power supply.
This function is performed by the FF's INSA, VACA and USBA.
The FF INSA is set by the 2nd edge of the signal SESA, i.e. by the last one among the 3 signals MEOC, TISO and FIBE if there is not a check error ($\overline{\text{ERCA}}$) and provided that the stroke counter has not already reached 160 (FITA).

The set of the FF INSA causes the reset of the FF VACA (INSAN) and unless a charge is already running (signal CARI high) it takes away from the cyclic power supply the validation to the hammer-drivers charge.
Expired the eventual charge running and evntually also the time for the hammers recovery (ATMA) we will have, timed from the negative edge of the signal DEPI, the set of the FF USBA (SEBAN), that identifies the actual printing phase and that causes, with its set, the FF INSA (USBAN) reset.
The printing phase will consist of a number N ($1 \leq N \leq 64$) of cycles equal to that described below. The cycle will be sent by the negative edge of the signal DEPIN which will produce the register loading with the new character of the photodisc and the univibrator RERI start which, with a delay of 10 usec triggers the GEMA RIZO which causes the start of the internal timing of the MEM 170 (TE00). In this way, it is started a reading/writing cycle of the 160 buffer positions constituting the characters to be printed.
During the reading of every one of these characters, the reading contents are loaded into the register ME of the MEM 170; this will be then compared with the register FO and the confront will be timed by the pulse TIBUN emitted by MEM 170.
In case that the comparison gives a result of equality, a printing command will be given to ATA 140 and a counting forth wise (CODI) will be performed in the strobe register BA. Besides, at every memory cycle, a counting forth wise will be performed in the register CIO timed with the pulse TEO2N. The cycle described above will be repeated for all the 160 positions constituting the printing line.
At the 1st edge of the TEO2N related to the 100th cycle, the signal CORI is taken away so blocking the internal timing of the MEM 170. On the same

edge of TE02N it is generated the signal R160 which causes the reset of the addresser register CIO which is in such a way replaced on the initial address of the next line sweep (CIO = 0).
A possible condition for any one of these sweeps is that the stroke counter (BA01 ÷ BA08) reaches the value 160; that corresponds to the printing end.
If this thing occurs we will have on the 1st edge of the last printing command (CODI) the univibrator FISA start (TEBAN). Such univibrator will cause, soon after the end of the cycle of the buffer timing related to the last printed character, the stop of the cycle with the FF USBA reset.
The printing phase end will be given anyway by the FF VACA set (SECAN) timed by the following step.
Such reset will trigger the univibrator LICA which will inhibite the paper movement as long as 2.5 usec after the last hammer command, and it will set the FF ATMA starting in such way the hammers recovery phase.
During the whole printing phase (FF USBA in set) the cycle counter register CLO will be counting; the counting will be made on the 2nd edge of the signal R160 emitted at the end of every sweep of the line contained in the buffer. The counter CIO has the purpose to check that the printing of any one of the lines is accomplished in a complete revolution of the characters drum; it produces in fact, at the end of the 64th sweep of the buffer positions containing the printing line, the start of the univibrator FISA which establishes the end of the printing phase causing the FF USBA reset.
The following step (the 65th) sets the FF VACA which will free the channel resetting the FF UNOC while the FF ERCO will be set. During the whole printing phase (FF USBA in set) the check controls are performed on the codes read by the

photodisc and on the codes read by MEM 170. If there is one of the two types of errors, the FF ERUN sets and causes the appearance on interface of the signal SEGE. In the specific case of check error on the photodisc codes also the FF ERAR will be set, it will cause the turning on of the lamp PRINT CHECK on the operating panel.

6.?.3.6. Functional description of the hammers recovery phase

Between two following commands to the same hammer a recovery time of 18.3 msec is prescribed. This recovery phase is started in the GOC 200 by the FF ATMA set. This FF enables the counting in the register RE of the negative edges of the signal DEPI. The hammers recovery time is infact calculated counting a steps number such as to realize a total waiting time t ≥ 18.3 msec. Since it is provided that the GOC 200 is used in subsystems equipped with machines at 1100, 800 and 730 rpm, we will have various computations according to the various mechanics. For this reason the ATA 140 will code on two wires the various connected types of mechanic; the coding is showed in the following table:

RUO2N	RUO1N	ROLLER SPEED
0	1	1100 rpm
1	1	800 rpm
1	0	730 rpm

Particularly for printers at 1100 rpm the FF ATMA will be reset by the negative edge of the 20th DEPIN; in the printers at 800 rpm, by the 14th DEPIN and in the printers at 730 rpm by the 13th DEPIN.
The command to the hammers will be practically given two steps after the FF ATMA reset.

7. INTERFACE

The GOC 200 has three interfaces that respectively connect it to the CPU, to the ATA 140 and to the buffer memory MEM 170.
The interface for the connection to CPU is the standard ISI interface series 100.
For the signals definition of this interface, see the PDS # 300740110. The GOC 200 being an output controller, provides only 3 cables from the interface i.e. the cables A,C,D.
The cable A (AIFU, BIFU,.......) is in the position E.01, the cable C (CAGU, FINU,......) is in the position E.02, the cable D is in the position E.03.
Another interface is the one that connects the GOC 200 to the ATA 140. For the description of this interface, see the PDS of the ATA 140 # 78A101868.
This interface is composed by 5 cables. The cables are so disposed:

1st cable (SE01N, SE02N) in position A.01

2nd cable (F011N, F012N) in position A.02

3rd cable (CI01B, CI02B) in position B.01

4th cable (MAREA, FU22A) in position B.02

5th cable (F021N, F022N) in position A.03.

The 3rd interface is related to the connection to MEM 170 and it is composed with 4 cables NS 47.
The topography and the signal disposition are the following:

01	CI011	CI081	ME01	ME08
02	CI01A	CI08A	ME01N	ME08N
03	CI021		ME02	TIBUN
04	CI02A	CAGUA	ME02N	TE02N
05	CI031	TE00	ME03	
06	CI03A	CORI	ME03N	
07	CI041	FIBEA	ME04	
09		AIBU		
10	CI04A	BIBU	ME04N	
11	CI051	CIBU	ME05	
12	CI05A	DIBU	ME05N	
13	CI061	EIBU	ME06	
14	CI06A	CIBU	ME06N	
15	CI071	LIBU	ME07	
16	CI07A	MIBU	ME07N	
	F.01	F.02	F.03	F.04

The logical meaning of the signal is the following:

CI011÷CI081 : positive levels from the columns addresser

CI01A÷CI08A: negative levels from the columns addresser

CAGUA : negative level of general reset to MEM 170

TE00 : negative starting pulse to the delay line of MEM 170

CORI : positive consent level to the timing recycle of the MEM 170

FIBEA : negative level of reading inhibit

AIBU÷MIBU : positive pulses of the bits 01÷08 to MEM 170

ME01÷ME08 : positive levels bit 01÷08 from MEM 170

TIBUN : negative pulse defining the reading time

TE02N : negative pulse which gets the addresser register CIO to count.

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CORRESPONDENCE BETWEEN CHARACTERS OF THE NORMAL DRUM AND GECD INTERNAL CODE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0					0	BLANK					↑	+					0000
1					1	A					J	/					0001
2					2	B					K	S					0010
3					3	C					L	T					0011
4					4	D					M	U					0100
5					5	E					N	V					0101
6					6	F					O	W					0110
7					7	G					P	X					0111
8					8	H					Q	Y					1000
9					9	I					R	Z					1001
A					[	&					–	←					1010
B					#	•					$	,					1011
C					@	]					*	%					1100
D					:	(					)	=					1101
E					>	<					;	”					1110
F					?	\					’	!				ƀ	1111
	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111	

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1. GENERAL CHARACTERISTICS

1.1. General

The power supply ALI 310 has been designed to operate the controllers and the printers I 51/C in all their features. It includes also the DOE for the paper-transport (interline and jumps) and, for the B model, also the clutch command of the magnetic printing ribbon CMC7

It provides as output, the voltages :

+60 V PULSE : charge of printing capacitors
+2,5 V-10 A : supply of the photoreading lamps

It provides besides the commands for the electromagnets of the clutches and the brakes for the paper-transports.

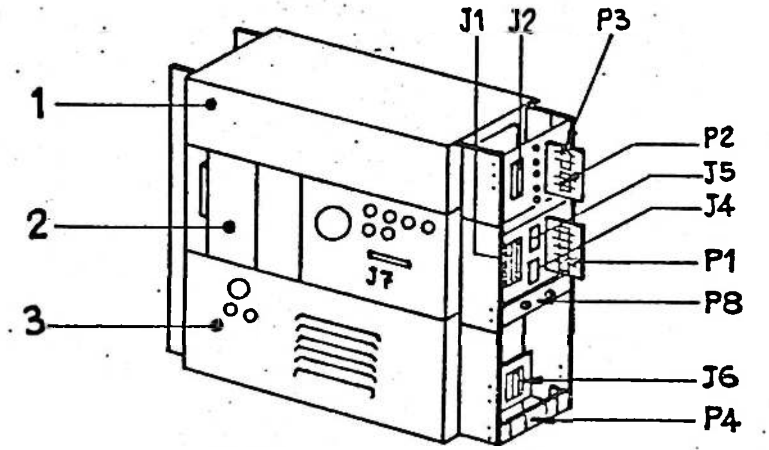
1.2. Physical configuration

The power supply consists of two and a half SMN modules with the following denominations :

1 - Half a module secondary voltages
2 - Module Services and Commands
3 - Module cyclic power-supply

Total weight ≃ 95 Kg.

Modules arrangement :



1.3 Electrical characteristics and configurations

Main power 3-phase	Vrms	220	or	208
Frequency of the main power	Hz	50	"	60
Max absorbed power with full load in the max configuration	Va		2000	
Max absorbed current by phase at full load in the max configuration	Ix A			6
	Iy A			6,5
	Iz A			6
Power factor at full load	Cos φ			0,65
Developed Kal/h				1,370

1.4 Operating environment

The unit must operate in an environment with the following characteristics :

Temperature	+ 10° C	÷	+ 38° C
	+ 50° F	÷	+ 100° F
Rel. Hum.	20%	÷	80%

2. MODELS

The power- supply ALI 310 can be provided in three models and precisely :

Model A

Main power 3-phase : 220 V 50 Hz
One or two paper transport
OPZ 311

Model B

Main power 3-phase : 220 V 50 Hz
for printer with CMC7 characters and either one or two paper transport, OPZ 311.

Model L

Main power 3-phase : 208 V 60 Hz
either one or two paper transport OPZ 311.

All the three models have the same performance ; the B Model has in addition the part concerning the command of the clatches for the magnetic ribbon transport (printer CMC7).

3. FUNCTIONAL DESCRIPTION

3.1 General block diagram

Refer to the diagram n. 78B101892.
The alternate main voltage coming from the supply unit ALI 260 and related main filter ALI 290, is brought in the strip P1 on the commands and service module and from here is sent to the printer and to the secondary voltages module.

The power voltage to the cyclic supply module is provided by a transformer and a 3-phase bridge sitting in the printer.
The commands and service module provides also the auxiliary voltages to the cyclic supply; in that module are sitting the interface connectors among power supply, D.O.E. and printer.
The secondary voltages module provides straightly the supply voltage to the photoreading lamp of the printer.
The cyclic power supply provides straightly the power voltage for the charge of the print capacitors.

4. HALF MODULE OF SECONDARY VOLTAGES

4.1. Block diagram

Referring to the drawing 78 B 101991, the following parts can be distinguished :

- Power supply	2,5	V	10	A
- Transformer	90	V	2	A

4.1.1. Power supply 2,5 V - 10A

See drawing n. 78B101707-
It is formed by the following parts :

- fuses F4 and F5
- regulater at saturated iron T3 with thermal protection
- resonant capacitor C2
- rectifier diodes D34 and D35
- filtering inductor L2 and filtering capacitor C1

- regulating resistor RV1
- Breaker S3

4.1.2. Transformer 90 V - 2A

It is the T2 transformer in the drawing 78B101707; it is protected on the primary circuit by the fuses F1 ÷ F3 and is provided with thermal protection.

4.2. Functional description

4.2.1. Power supply 2,5 V - 10 A

The T3 transformer, protected by the fuses F4 - F5, provides an alternate voltage of 3,5 V to the diodes D34- D35 : that voltage, rectified (except the voltage drop of the diodes) is then filtered by a LC cell and through the resistor RV1 and the breakerS3, is brought to the user.
The RV1 resistor acts as to compensate the eventual voltage drop on the connecting cables.
The output voltage is adjustable from 2,4 ÷ 2,6 V about.

4.2.2. Transformer 90 V - 2 A

It is a threephase transformer D/Y protected on the primary coil by the fuses F1 ÷ F3 and provides a voltage of 67,5 V . That voltage, trough the J2 connector is sent to the services module where the 3-Phase rectifier bridge is sitting.

4.3. Interconnection of the half module

The secondary half module is interconnected with :

- Services module and MOC I51/C

The connection with the services module is obtained with :

- Strip P2, which provides the main alternate voltage
- connector J2 , which brings to the services module the voltage of 67,5 V provided by the transformer T2.

The connection with the MOC I 51/C is made trough the strip P3.

5. COMMAND AND SERVICES MODULE

5.1. Block diagram

See the diagrams n. 78B101995 and 78B101991
The services module is formed by :

- power supply 24 V + 10% 1,5 A
- power supply + 12 V ± 5% 0,5 A
- firing circuit
- turn - off circuit from manual command
- turn - off circuit from D.O.E.
- thermal protections
- check lack of a phase voltage 90 V
- sensing + 20 V CPU
- lighting signals
- OPZ 311 (box paper transport) either one or two boxes
- printed board Friz (for CMC 7 only)

5.1.1. Power supply 24 V ± 10% 1,5 A

It supplies all the command and service circuits.
As can be seen from the diagram 78 D 101726 it is formed by :
Fuses F6 ÷ F7
Single-phase transformer T1
Rectifier bridge sitting on the card SUTE
Filtering capacitor C3

5.1.2. Power supply ± 12 V - 0,5 A

It is a power supply, Zener regulated, which provides the voltage of ± 12 V, within an accurency of ± 5%, to the cyclic supply module.
Moreover through a contact of a relay, it provides also, to the same module, a delayed voltage of - 12 V.
See the diagram n. 78 D 101726. It results composed by :
- Transformer T1
- Rectifier bridge sitting on the card SUTE
- Filtering capacitors C4 and C5
- Resisters for the zener diodes supply R 31 and R32.
- Stabiliziing zener diodes D25 and D26 sitting on the card SUTE

5.1.3. Firing circuit

See the diagram n. 78 D 101726. It results composed by :

- push-button S 2 - Relay RL 13
- breaker TL 1
- Relay RL4 - RL7 + RL2 sitting on the card SURE
- timing circuits sitting on the card SUTE

5.1.4. Turn - off circuits

It results composed by :

- Push-button S 1
- Relay RL1 sitting on the card SURE

5.1.5. Turn - off circuit from D.O.E. ATA 140

It is composed by :

RL 5 - RL6 - RL3 sitting on the card SURE, R34 and J7

5.1.6. Thermal protections

They are formed by all the series of the TM's normally closed of the printing sub system, by the relay RL2 - RL1 sitting on the card SURE and by R33 and J7

5.1.7. Protection against lack of a phase 90 V

There is, on the card SUTE, a circuit, acting as a protection against the lack of a phase, which commands the relays RL5-RL6-RL3 sitting on the card SURE.

5.1.8 Sensing + 20 V CPU

On the card SUTE there is a circuit with a threshold of about 16V which perceives the actual presence of the +20V CPU. It acts on the relay RL1 of the card SURE

5.1.9. Lighting signals

On the front panel there are sitting four lamps.

SL1 - OFF	yellow
SL2 - ON	green
SL3 - ALERT	red
SL4 - TEMPERAT	red

SL1 and SL2 are commanded by TL1
SL4 by RL2
SL3 by RL3

5.1.10. Box paper movement OPZ 311

It is formed by a movable box which comprehends the drive circuits for the clutch and brakes electromagnets to execute the interlines and the jumps.
These it can be either one or two anording to the printer is provided with one or two paper transports.
The operating circuits of low paper are sitting on a movable printed board (FREF)

5.1.11 Clutch command for the magnetic ribbon (board FRIZ)

It is a device suitable to command the transport clutches for the magnetic ribbon used on the printer with CMC7 characters.
This device commands the magnetic ribbon advance just in the

time strictly necessary in order to save as much as possible the magnetic ribbon.

5.2. Functional description

5.2.1. Functions

The commands and services module performs the following functions :

- firing sequence
- turn - off sequence
- command of the group clutch brake for the paper transport
- command of the CMC 7 ribbon transport

5.2.1.1. Firing sequence

The actual presence of the alternate voltage in the sub-system determines the auxiliary voltages generation :

+ 24V which provides the command circuits
± 12V which provides the command circuits in the cyclic power supply.

This presence is sognalized by the lighting of tle yellow lamp OFF.
In this condition the signals SOFE 1 and TATO 1 are at + 5V
The forces FOTE to the hammer drive boards, to the paper - movements and to the cyclic power supply module are present.
Pressing the button ON (S2), provided that the + 20V is present, TL1 is attracted through RL13; TL1 turns off the lamp OFF and turns on the green one of ON, and provides the main power to the transformers of 90 V, of 2,5 V and to the MOC I 51/C.

MOreover TL1, attracting, opens RL4 after 50 msec given by the group R9 and C6; the time is necessary to estinguish the transient effects. RL4 swhitching open, sends through two of its contacts, the voltages +12V and - 12V to the cyclic power supply module, and through the signal CGBO, gets attracted the breaker CT1 of the MOC I 51/C which supplies the motors drive triacs.
At the same time RL4 gets RL7 attracted. RL7 sets SOFE 1 to 0 V, SOFEA to 5V and enables with the signal VECO the lack of phase check.

If the drum and the jump enclosure are open, the sequence stops till their shuting. After their closing, or after the attraction of CT1 if they were already closed, CAAP gets RL8 excited, it opens after 150 msec (given by the group R11 and C7) the relay RL9 which generates CORE and TEMO.
CORE acts on the command of the triac gates starting the motors.
TEMO starts a timer of 3 sec, which covers the rising to steady state of the motors.
After this time, RL 10 gets excited and sends the voltage -12 R to the SCR triggering transformers on the cyclic supply module the COZE signal which enables the switching ON of the lamp on the table and gets unexcited the relay RL 11 after 50 msec, given by C10 and R21.
The opening of RL11 gets RL 12 excited.
RL12 takes away the forces FOTE and FOTEA. It sends TATO 1 to zero, TATOA to 5V and turns on, through the signal LION, the 2nd portion of the button ON on the table.

5.2.1.2. Turn-off sequence

The turn off can be caused by the following :

- depressure on the button OFF
- lack of the + 20 V coming from CPU
- thermal protection intervention
- lack of phase circuit intervention
- logic check of the performance of the hammer-drive boards and cyclic power supply module

By opening the drum and the jump enclosure, a partial turn off occurs.

Depressure on the button OFF

By pressing S1, RL1 gets excited and with one its contact opens RL12 which sets again the forces FOTE and FOTEA, sends TATO1 to + 5 V and TATOA to 0V.
In the same time RL7 relaxes and sends SOFE1 to + 5V and SOFE to 0V.
RL7 opens RL8 which gets RL9 excited.
RL9 attracting takes away CORE and TEMO. The lack of CORE stops the motors.
After the fall of TEMO a timing of 60 msec is given by the same timer which gave 3 sec. in the firing phase; after that RL10 is relaxed.

RL10, relaxing, takes away the voltage -12R from the cyclic module. The 60 msec between the beginning of the forces and the fall of -12R are provided in order to permit the completion of an eventual charge cycle rnning.

Moreover the relaxation of RL10 gets excited RL11 which opens RL13 and the consequent fall of TL1. The signalization ON swtches off - OFF switches on.

Lack of the + 20V coming from CPU

When the voltage +20V from CPU is present, TR1 is in on and TR2 in off, RL1 is relaxed. When the +20V is missing, at a threshold of about 16 V, RL1 gets excited and the turn-off sequence keeps on as in the last paragraph.

Thermal protection intervention

The chain of thermoswitches takes to the coil of RL2, through one of its contacts, the ground. When a thermoswitch opens, RL2 gets excited through R33 and switches on the lamp SL4 TEMPERATURE and SL3 ALERT; besides it sends to the table the signal LAAL which turns on, on the table itself, the red lamp ALERT.
Moreover RL2 gets RL1 excited starting the turn off sequence as per paragraph "depressure on the button OFF".

The thermal protections are staticized. To rest the normal condition the main voltage has to be taken away from the subsystem.
It is possible to inhibite the thermal protections with a bridge between the points 1 and 2 on J7.

Lack of phase circuit intervention

In operating condition, TR7 is maintained in on. With the lack of a phase it switches off and fires the SCR D28 which gets excited RL5, which subsequently starts the turn off sequence and excites RL6.
RL6 gets excited and takes the forces again, while exciting RL3which staticizes the ALERT signalization, sending the signal LAAL to the table.
The protection can be inhibited by connecting the points 3 and 4 on J7.

Logic controls

The ATA 140 performs on operating control on the cyclic power supply module

and on the hammer-drive boards. In case of misoperation it sends to the services module on the ALI 310 the signal CIPAB which gets RL 5 excited.
The sequences keeps on as per last paragraph.
This protection can be inhibited by connecting the points 3 and 4 on J7.

Drum and enclosure openings

By opening either the jump enclosure or the drum, the signal CAAP 1 falls. RL8 relaxes and takes the forces again by opening RL12. RL9 gets excited and causes the fall of CORE and TEMO. CORE takes away the power to the motors; the falling of TEMO starts a delay of 60 msec and gets relaxed TL10 which causes the fall of the -12R voltage.
This operation is signalized on the command table by the switching-off of the lamp LION.
Closing both, starts again the firing sequence as per paragraph 5.2.1.1.

5.2.1.3. Command of the paper transport brake and clutch group CPZ 311

See the diagrams n. 78D101727 (Box 1st paper transport) and n. 78B 100281.
With the subsystem in OFF, the signal FOTE is to zero and the +20 voltage is present; TR16 and TR17 are off and TR15 is on.
Switching on the subsystem, the signal FOTE goes floating, TR17 begins to drive the current and gets on the SCR D33 related to the brake, D33 causes the discharge of the capacitor C17 on the brake coil with a high peak current (≃ 40A) which after trends to 300 mA.
With the signal of movement command at high level (MAT 11 for the 1st movement, MAT 21 for the 2nd) TR17 gets saturated and fires the SCR D32, related to the clutch.
The cathode of D32, which before the command was at the ground is brought to 80 V.
This voltage charge on C17 trends to bring to 90 V also the cathode of D33, which, for the reverse voltage applied, gets off. C17 charges to 90 V through R43-21 and D30

during the command time which is, as a minimum, 5,5msec (L1 limites the peak current). When D32 turns on, C 22-23 discharge on the clutch coil and, according to the resistance value given by the potentiometer RV2, there is a more or less high value of peak current, which,after the transient, goes to 200mA. Going back to zero the command, takes place again the condition D33 ON and D32 OFF.
The capaciters C22-23 charge through R41 to 90V.

Electrical characteristics

a) Supply voltage: +20V -45mA max from CPU

+90V $^{+10\%}_{-15\%}$ 7A max and 1A average with normal interline (t brake = 45msec, t clutch = 5,5 msec) from the secondary voltages module.

5.2.1.4. Command of magnetic ribbon transport

Exists only for ALI 310 mod.B.
See the diagram n° 78D101727

Printer preset for normal printing

The relay RL21 is relaxed. When the top motor is driving, the signal FISU 1 saturates TR 11 while the signal FIBA 1 keeps turned off TR 12; therefore in the top clutch flows a current of 110mA and in the bottom one a current of 25mA.
With the inversion of the ribbon movement (reached end of ribbon),that is when the bottom motor is driving,FISU 1 turns off TR11 and FIBA 1 gets TR12 conducting,and therefore in the bottom clutch flows a current of 25mA.

Printer preset for magnetic characters printing.

The relay RL21 is excited by the signal REMA. In this case the driving motor is always the top one. During the ribbon movement the signal FISU 1 saturates TR11, and therefore in the top clutch flows a current of 110mA; the signal FIBA 1 keeps TR12 turned off, and therefore in the bottom clutch does not flow any current.

During the printing the signal FISU 1 turns off TR11, the current in the top clutch goes to zero and the transport stops.

The signal FIBA 1 gets conducting TR12 which permits the flow of a current of 110mA in the bottom clutch.

5.3 Interconnections

The interconnections of the commands and services module are :

- Half module secondary voltages
- cyclic power supply module
- ATA 140
- MOC I51/C
- Threephase main power

5.3.1 Main power

It is obtained through the stripP1.

5.3.2. Half module secondary voltages

It is obtained through :

P1 for the alternate voltage
J1 -1÷6 for the termoswitches and the 90V bridge supply.

5.3.3. Cyclic power supply module

It is obtained through the connector :

J1 - 2 -1 ÷ 2 -6
J1 - 3 -1 ÷ 3 -6
J1 - 4 -1 ÷ 4 -6

The following signals are exchanged :

J1 - 2 -1	+24 VDC	Command circuit supply (LOCO)
J1 - 2 -2	+12 VDC	
J1 - 2 -3	-12 VDC	
J1 - 2 -6	FOTE	tecnical locking of the cyclic power supply
J1 - 3 -1	MARI	reference ground
J1 - 3 -2	VARI 2	charge validation
J1 - 3 -3	INCAN	beginning of charge
J1 - 3 -4	FIRI 1	end of charge
J1 - 3 -5	-12R	supply SCR command transformers
J1 - 4 -3	POTE 2	Termoswitch for SCR protection
J1 - 4 -4	POTE 1	

J1 -4 -5	AC1	Power supply to the blower
J1 - 4 -6	AC2	

5.3.4. Connection to ATA 140

It is obtained through the connector I5.

5.3.5. Connection to MOC I 51/C

It is obtained through the connector I4 and the strip P1 for the alternate voltage.

6 Cyclic power supply module

The cyclic power supply provides the charge of the capacitors for the printing hammer drive, before the printing.
It is a pulse power supply with SCR's normally with the power circuit insulated from the load. During the charge cycle there is an SCR which closes and permits the flow of the current into the capacitors. When the charge is accomplished, the SCR opens so insulating the power supply from the load.

6.1. Bock diagram

See the drawing n. 78 B 101882 and 78 D 101710 .
The cyclic power supply is composed by the following principal parts :

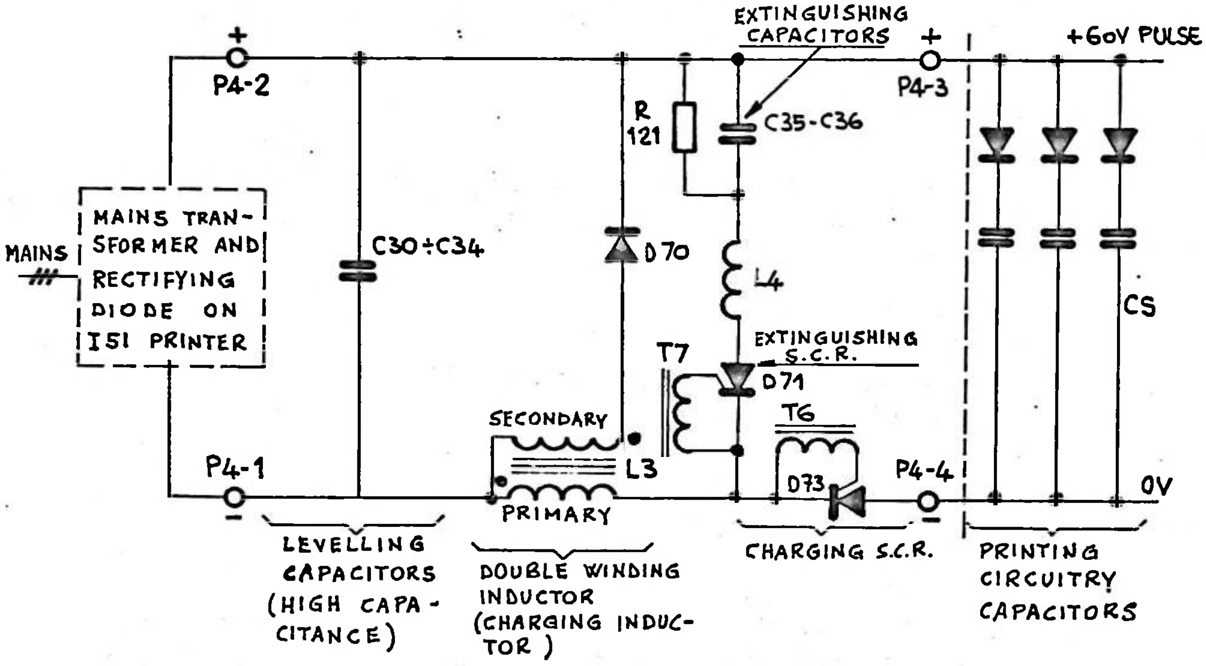
- power circuit
- command and control board LOCO
- power auxiliary circuits board ALCI
- power strip P4
- signal interchange connector J6

6.2. Power circuit

It is composed by a threephase transformer D/Y and by a 3-phase rectifier bridge sitting in the printer base.
The cyclic power supply receives the rectified current, which is roughly stabilized by the capacitors C30 ÷ C34.
Power supply : 50 V rectified current.

6.2.1. Operating principle

The operating principle can be understood seeing the schematic diagram showed below


EXTINGUISHING CAPACITORS
+
P4-2
+
P4-3
+60V PULSE
R 121
C35-C36
MAINS TRANSFORMER AND RECTIFYING DIODE ON I51 PRINTER
MAINS
C30÷C34
D70
L4
CS
T7
EXTINGUISHING S.C.R.
D71
T6
SECONDARY
L3
P4-1
PRIMARY
D73
P4-4
0V
-
-
LEVELLING CAPACITORS (HIGH CAPACITANCE)
DOUBLE WINDING INDUCTOR (CHARGING INDUCTOR)
CHARGING S.C.R.
PRINTING CIRCUITRY CAPACITORS

There is basically a resonant circuit formed by the coil L3 and by the total capacity CS (hammer-drive board capaciters).

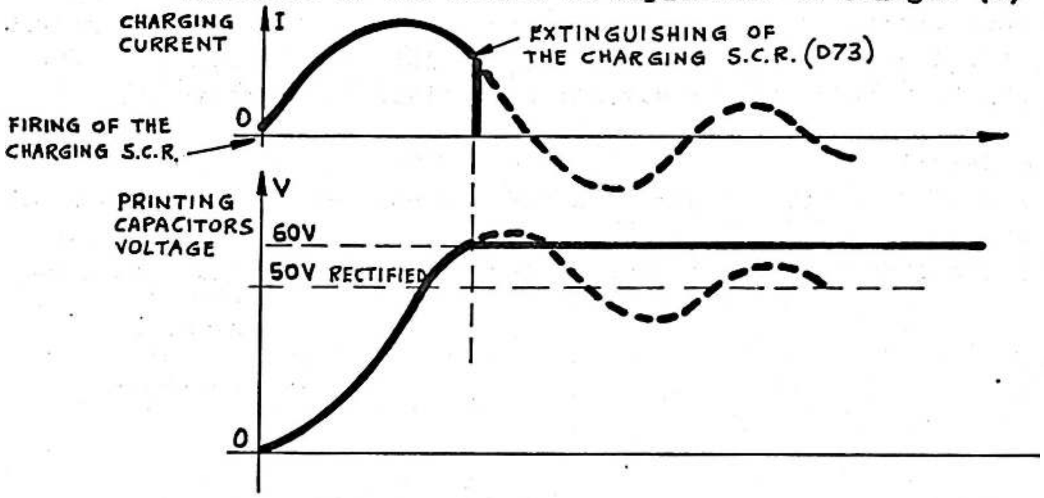
The charge of the printing capaciters begins when the charge SCR D73 is commanded, i.e. 8,8 msec after the arrival of the charge command VARI2. The capaciters then charge through the double winding coil making a series oscillating circuit.

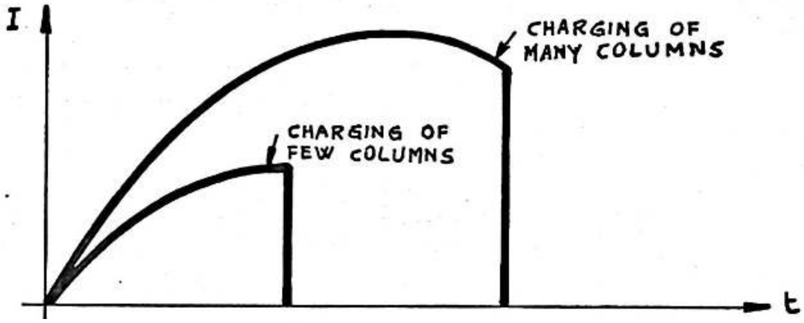
As a consequence of the values ratio of C - L - R in this oscillating circuit, the capaciters Cs tend to charge to the filter capaciters voltage with tend, then overshooting that voltage value. Reching the 60 V in output, there is suddenly the turn off command with opening of the SCR D73.

The printing capaciters Cs are so charged at 60 V.

The second winding of the coil (secondary) acts against the overvoltages and also saves the energy stored as magnetic flux in the coil when the current flowing in it (at the moment of the turn off of the SCR D73, and then of the charge) is not 0.

Wave shape of the current flowing in the charge SCR as a function of the number of capacitors to charge. (b)


CHARGING CURRENT
I
EXTINGUISHING OF THE CHARGING S.C.R. (D73)
0
FIRING OF THE CHARGING S.C.R.
V
PRINTING CAPACITORS VOLTAGE
60V
50V RECTIFIED
0



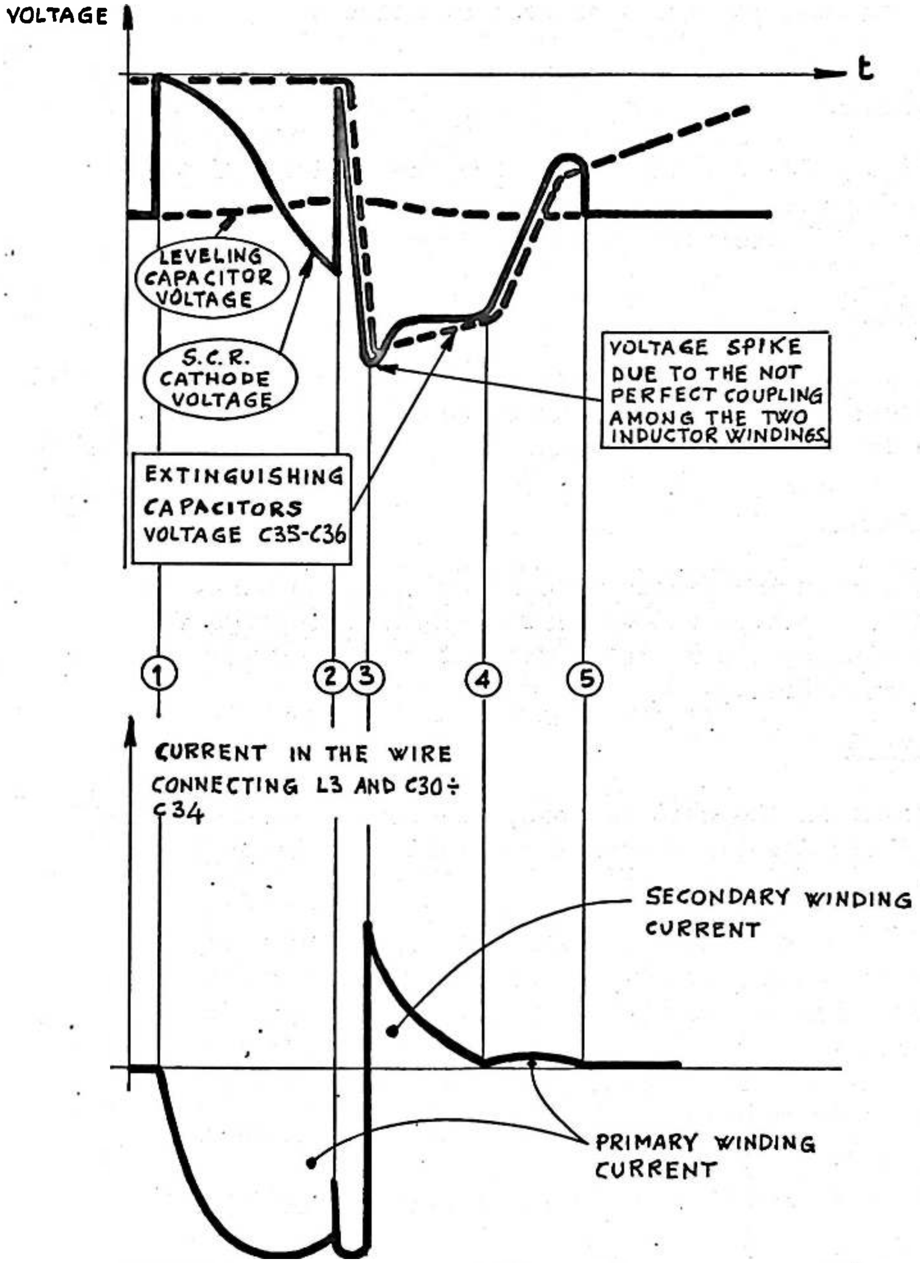
The charge SCR is thermally protected by the switch TM1 which, behaving at a temperature of 65°C, sets off the whole subsystem through the appropriate circuit sitting in the command and services module.

6.2.2. Turn off device

To open the charge SCR it is set open the turn off SCR (D71) this absorbs the current stored in the coil and tends to reverse the current flowing in the charge SCR which opens. The small air coil in series (L4) avoids a too fast fall of the current flowing in the charge line (output) and avoids as well a to high peak of reverse current in the charge diode. Once fired D71, the coil L4 is in the same oscillating circuit with the turn off capacitors C35 - C36; the amplitude of the ripple voltage of the circuit is limited by the second winding of the coil, connected to the common line +60V through a diode.
The SCR'S of charge and turn off are connected to the command circuit through the pulse transformers 76-T7, thus making a complete insolation between the command and power circuits.

6.2.3. _ Explaining diagram

The wave shapesare referred te the +60 V line


VOLTAGE
t
LEVELING CAPACITOR VOLTAGE
S.C.R. CATHODE VOLTAGE
EXTINGUISHING CAPACITORS VOLTAGE C35-C36
VOLTAGE SPIKE DUE TO THE NOT PERFECT COUPLING AMONG THE TWO INDUCTOR WINDINGS
①
②
③
④
⑤
CURRENT IN THE WIRE CONNECTING L3 AND C30÷C34
SECONDARY WINDING CURRENT
PRIMARY WINDING CURRENT

D71 (turn eff SCR) opens at the moment n.4,unless it is already open at the moment n.3.

Moment n. 1

The charge SCR D73 begins to conduce (fires)

Moment n. 2

The turn off SCR D71 fires, causing the switch off the charge SCR, the coil is now in oscillating circuit with the turn off capacitors (C35-C36)

Moment n. 3

The diode D70 in serie with the secondary winding of the coil starts to conduce; the current flows in the secondary and repeals in the primary winding.

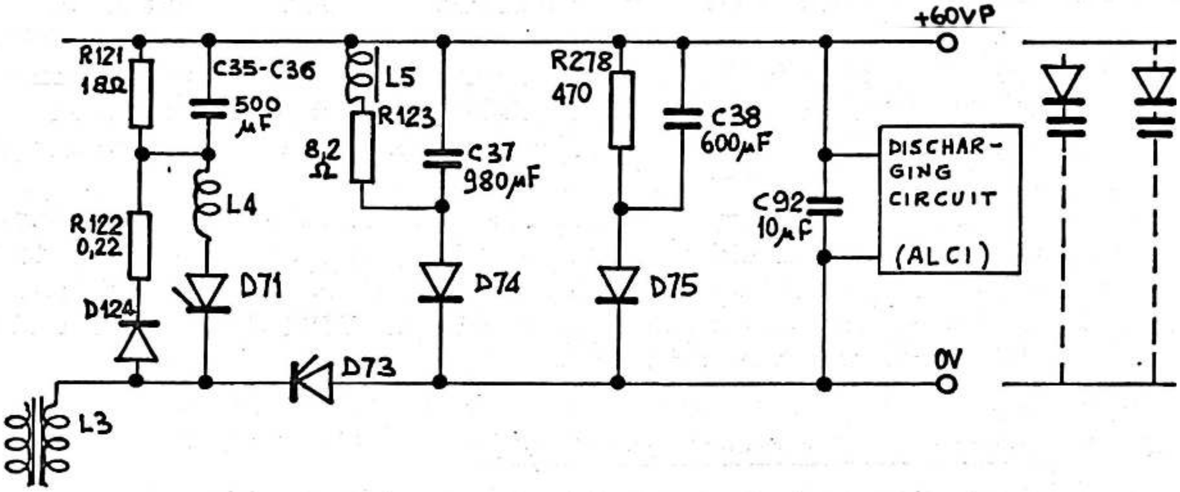
Moment n. 4

The current on the secondary winding tends to zero, the turn off capacitors C35-C36 are discharged through the primary winding the resistor R122 of 0,22 Ohms and the series diode (D124).

Moment n; 5

The current in the coil is zero, the turn off capacitors finish their discharge over the parallel resistor R 121 18 Ohms.

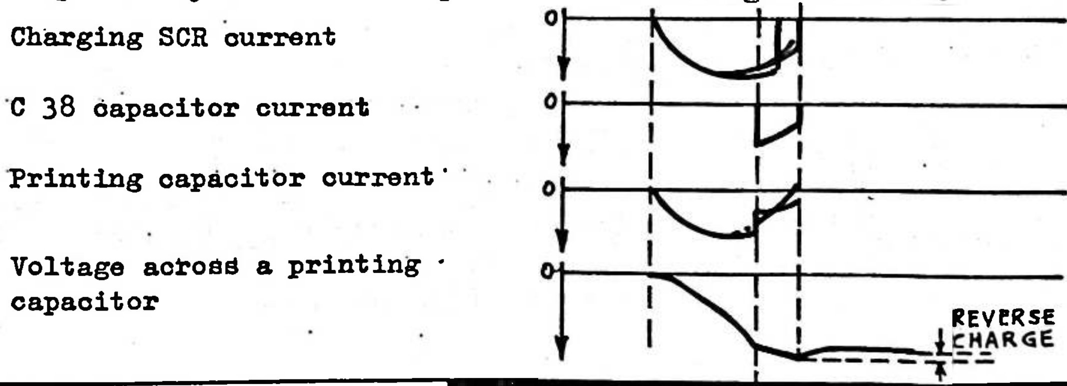
6.2.4. group C37 - R123 - L5



This capacitor consents a good performance of the device when the number of the columns to charge is little or null, fixing the minimum charge time. The group L5 -R123 (8,2 Ohms) discharges quickly the capacitor after every charge.

6.2.5. Leveling group C38 - R 278

This capacitor discharges only a little between two following charge cycles (about I5 ÷ 20V) and permits to have a charge current to the printing capacitors of such a shape (with slow slope) to maintain the charge retroaction on these capacitors at not too high level. The performance of this capacitor is useful expecially when the capacitors to charge are few.



6.2.6. Capacitor C92 (Board ALCI)

The capacitor C92 (IO µF) sitting on the power line (+60V and OV) provides the current which, through the SCR D7I, is forced in the opposite direction in the charge SCR D73, at the turn off instant, to cause the opening of it. This capacitor decreases also the commutation noise during the turn off of the power SCR (electromagnetic noise irradiation).
The discharge circuit, sitting in parallel to the capacitor, takes quickly to zero, after the SCR opening, the voltage on the power line (remainded capacitor voltage) enabling the emission of the signal FIRI 1 (charge end) which starts the printing.

6.3. Command and control board LOCO

Block diagram: see the drawing n. 78B IOI882
In the following description the components are called with the same symbols used on the electrical drawing n. 78D IOI7IO.

6.3.I. Input circuit

Main components TR30, TR32,C52 .
This circuit filters the signal VARI 2 (charge command from ATA I40) in order to avoid any spurious command to the supply by a noise. The input stage has an AND with diodes and has a trigger threshold of about 3V. The charge command works only if the signal FOTE (forcing to zero) is floating. C52 filters the high frequency and short noises.

Charge command (VARI 2) to OV : TR30 and TR32 open
charge command (VARI2) over 3V : TR30 conducting
TR32 saturated.

6.3.2. Charge Flip-Flop

Main components TR33 and TR34.

It goes to the CHARGE state (TR33 open, TR34 saturated) when there is the charge command (VARI 2 to +5V) provided that the duration threshold n. 1 is in quiet (TR57 saturated). It goes to the CHARGE state when the signal VARI 2 goes to zero (TR32 opens).

6.3.3. Monostable n. I

Main components : TR35 TR36 R24 C58
In quiet state: T35 is saturated and TR36 is open.
This monostable works when the flip-flop goes in CHARGE state (TR34 closes) or when the duration threshold n. 2 goes in quiet state (TR60 closes).
The potentiometer RV 4 determines the time of the monostable (setting value : 8,8 msec).

6.3.4. Comparing conditioner

Main components: TR37 -C59.
This conditioner , sitting between the monostable n. I and the one n. 2, permits the launch of the last one when the first comes back to quiet (TR36 opens) provided that the charge signal VARI 2 is high (TR32 saturated).

6.3.5. Monostable n. 2

Main components : TR38, TR39, RV5, C60.
In quiet state TR38 is saturated and T39 open .
This monostable workes when the monostable n. I comes back to quiet, if the charge signal VARI 2 is high.
If that signal is at 0V, the monostable is not launched
The working time of the monostable is set up with the potentiometer RV5, but this time can be shorted by the voltage comparer 6.3.6. (TR52, TR53) or by the fall circuit 6.3.I6 (TR6I).

6.3.6. Main voltage comparer

Main components : TR52, TR53,RV3.
Electrically speaking, it is a circuit fashioned as Smith trigger.
Quiet state: TR52 conduting and TR53 open.
Working state : TR52 open and TR53 conducing.
When the voltage on the power line +60V PULSE reaches +60V, the voltage comparer goes to working state, consequently also TR54, closes and causes the return to quiet state of the monostable n. 2.
The potentiometer RV3 permits to adjust the commutation

threshold of the comparer and then of the charge value for the printing capacitors.
When the voltage on the power line falls, the comparer goes back in quiet state.

6.3.7. Charge command amplifier

Main components; TR43, transformer T6.
This power amplifier provides the firing command to the charge SCR D73, when TR43 saturates. TR43 is connected, through TR40 and TR4I, to the monostable n. 2, it saturates when the monostable goes to working state. It blocks with the return to quiet of the monostable. When TR43 closes, there occurs a current pulse on the secondary winding of T6, which fires D73.

6.3.8. Turn-off command amplifier

Main components: TR44, transformer T7.
In quiet state TR44 is open.
This amplifier is guided by the turn off deriver bounded to the monostable n. 2
Main components of the deriver TR42, C62, RI80.
The deriver is launched when the monostable n. 2 returns to quiet; in that moment TR44 closes causing the firing, through the transformer T7, of the turn off SCR D7I.
The pulse provided by the deriver has a duration of about 80 usec.

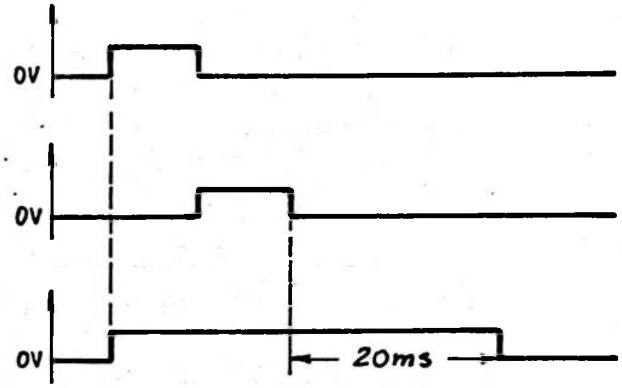
6.3.9. Duration threshold n. I

Main components: TR55, TR 56, TR57, C7I, R23I.
In quiet state TR 57 is saturated.
This duration threshold is commanded by the monostable n. I or n. 2, when they pass to work. It commutates (TR57 open) at the first command and comes back in quiet state about 20 msec after the command end.

Monostable n. I
(collector of TR35)

Monostable n. 2
(Collector of TR38)

Duration threshold n. I
(collector of TR57)



As long as the duration threshold is in working state, the charge Flip-Flop cannot go from the state $\overline{\text{CHARGE}}$ to the state CHARGE (it can, on the other hand, go from the state CHARGE to the state $\overline{\text{CHARGE}}$ if the command signal VARI 2 falls to zero).
This threshold commands also the duration threshold n. 2

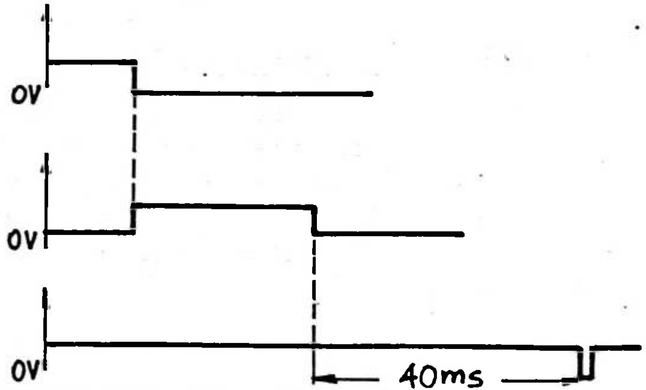
6.3.I0. Duration threshold n. 2

Main components: TR58, TR59, TR60, C73, R243.
In quiet state, TR60 is saturated.
This duration threshold is commanded by the FF, when it is in CHARGE state and by the duration threshold n. I when it is in working state.
The circuit goes to the working state when the command starts and goes back to the quiet state about 40 msec after the command end.

Charge Flip-Flop
(Collector of TR34)

Duration threshold n. I
collector of TR 57)

Duration threshold n. 2
(collector of TR60)



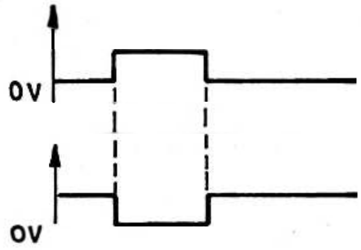
When the duration threshold n. 2 goes to the quiet state, it launches the monostable n. I
The connection among the various circuits is such that the threshold n. 2 remains in quiet state only a few usec.

6.3.II. Signal amplifier INCAN

Charge cycle beginning. Main components: TR45.
In quiet state TR45 is open . This amplifier provides the signal INCAN and it is bounded with the monostable n. I. The signal INCAN has the same duration as the monostable n. I

Monostable n. I
(Collector of TR35)

INCAN Signal
(Collector of TR45)



6.3.I2. Charge end voltage comparer

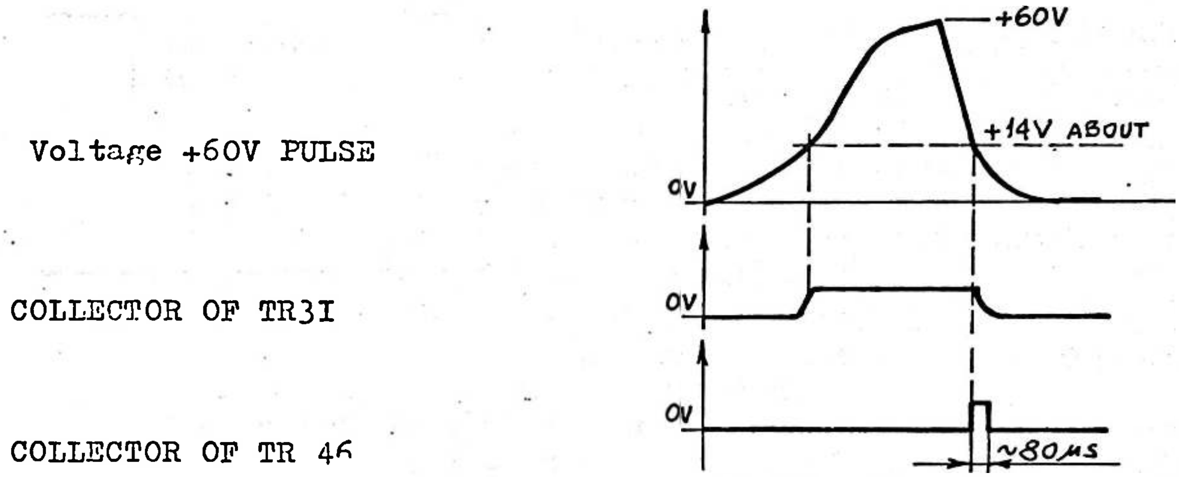
Main components TR50, TR5I.
Quiet state TR50 saturated, TR5I open.
It is a circuit similar to the main voltage comparer (6.3.6.).
The triggering threshold, not adjustable, is about 53-55V. The output, collector of TR5I, commands the charge validation monostable (6.3.I3.).

6.3.I3. Charge validation monostable

Main components TR48, TR49.
In quiet state, TR48 is open and TR49 saturated.
This monostable is launched when the charge end voltage comparer goes to work state (output voltage above 53V) and has a duration of about IO msec.

6.3.14. Charge end deriver

Main components: C55, TR31, TR46.
In quiet state TR31 and TR46 are saturated.
This circuit generates a pulse when the voltage on the power line (+60V PULSE) falls toward zero after a charge cycle.



6.3.15 Signal amplifier and conditioner FIRI I (Charge end)

Main components: TR47.
In quiet state TR47 is saturated.
When the deriver emits the end of charge pulse, if the charge validation monostable is in working state, there occurs the opening of TR47 for the same time of the pulse.

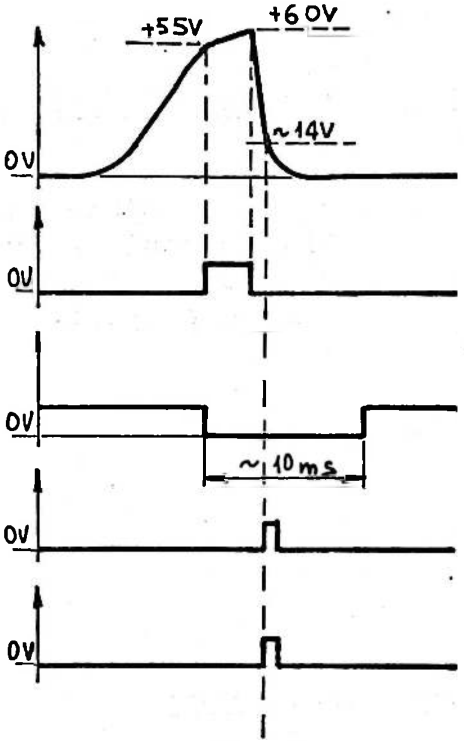
Voltage +60V PULSE

CHARGE END VOLTAGE
COMPARER TR5I

CHARGE VALIDATION
MONOSTABLE -COLL. TR48

CHARGE END DERIVER
COLL. TR46

SIGNAL FIRI I
COLL. TR47



6.3.I6. Falling circuit

Main components : TR6I.
The collector of TR6I is supplied only during the launch time of the charge validation monostable. That transistor is mantained conducting until the +60V PULSE voltage is rising; as soon as that voltage tends to decrease TR6I opens and saturates TR54 resetting the monostable n. 2 if for any cause it were returned or remainded to work at the charge end

6.3.I7. Board LOCO power supply

The command boards requires the following supplies :

+I2V ± 0,6V - about I20 mA
-I2V ± 0,6V - " 80 mA
-I2VR ± 0,6V delaied - I00 mA pulse, of variable duration from I to 8 msec.
+24 V ±2,4V - 50 mA

The -I2VR voltage is applied about 3 sec.after the others so that it finds the circuit already stabilized.

6.3.18. External signals

a) Signals coming in : I) Charge command VARI
2) Forcing to zero FOTE
b) Signals going out : I) Power supply under charge INCAN
2) Charge end FIRI I

Charge command signal VARI 2

The power supply provides a pulse of +60V 8,8 msec after the command signal arrival (VARI 2 high) provided that the charge before is already finished from a given elapsed time; infact the power-supply waits about 20 msec after every discharge before accepting any other charge command. If the command signal is not maintained at high level during the 8,8 msec preceeding the pulse, this does not occur and it is necessary to wait, after the 8,8 msec end, a time of about 20 msec. before a new command is accepted.
After a charge, if the command remainds high for more than 80 msec, the power supply sends a new pulse. This is made in order to maintain the capacitors charged when there are not continuous printings.

Foreing to zero signal FOTE

This signal is put in AND with VARI 2 in order to block its actions during the phases of switching on, switching off and out-of- service of the subsystem.
It remainds to zero during the forcing times.

Power supply under charge INCAN

This signal is commanded by the monostable n. I (8,8 msec) which delays the +60V pulse with respect to the charge command arrival ; it has a dutation of 8,8 msec and preceeds the +60V pulse.
If, during the 8,8 msec, the signal VARI 2 goes to zero the signal INCAN is not followed by the charge.

Charge end FIRI I

It goes out when, after the +60V pulse, the voltage reaches, falling down , about I4V provided that during the pulse at least 53-55V had been reached (See 6.3.I3)

6.3.I9. Turn on sequence

First time: power rectified voltage and voltages +I2V, -I2V and +24V.

Second time : after about 3 msec, voltage -I2VR

Third time : after going to zero of the forcing, FOTE floating.

6.3.20. Turn off sequence

First time : forcing to zero
Second time : about 60 msec after the forcing to zero, the voltage -I2V delayed falls to zero.
Third time : annulment of the other voltages.

These sequences are necessary in order to avoid that any charge starts under a transient noise.

6.4. Auxiliary power circuit board - ALCI

See the drawing n. 78DIOI7IO. Main components:C92-TR70, TR7I, TR72.
During the charging phase TR70 and TR7I remain in conduction keeping TR72 open; C92 charges to the output voltage (+60V).
Accomplished the rising of the +60V PULSE voltage, the transistors TR70 and TR7I are still kept on by C9I. The capacitor C92 can so provide the reverse current to help the switching off of the charge SCR D73.
With the opening of TR70 and TR7I, there occurs the quick discharge of C92 through TR72 and R[illegible]77 with consequent fall of the voltage on the power line and generation of the signal FIRT I.
The group DI23 and C93 supplies the signalization lamp "actual charge" SL6.

6.5. Power strip P4

The supplying line between the rectifier group (on MOC I5I/C) and the leveling capacitors is connected to the points I & 2.

The output line toward the printing capacitors (on ATA I40) is connected to the points 3 and 4.

Between the points 2 and 3 is inserted a shorting bridge, removing which there is obtained the insulation between power supply and load.

6.6. Interchange Connector J6

I - I	Power supply	+24 V
I - 2	" "	+I2 V
I - 3	" "	-I2 V
I - 6	Signal FOTE - Forcing to zero	
2 - I	Supply and signal	
2 - 2	Signal VARI 2 -;CHARGE Command	

2 - 3	Signal INCAN - power supply under charge
2 - 4	Signal FIRI I - Charge end of the power supply
2 - 5	Power supply - -I2 V delayed
3 - 3 3 - 4	Thermal protection swith D73
3 - 5 3 - 6	Alternate voltage to the blowers

7 Interface

The ALI 3IO has this interface :

with the MOC I 5I/C
with the ATA I40

7.I. Interface MOC I 5I/C

The ALI 3IO has the following interface toward MOC I5I/C:

Strip PI
" P3
" P4
Connector J4

7.I.I. Strip PI

PI - 9	X Phase	Main voltage	220 V - 50 Hz 208 V - 60 Hz
PI - IO	Y "		
PI - II	Z "		
PI - I2	Ground		

7.I.2. Strip P3

P3 - I	+2,5 V	Supply optical groups
P3 - 3	Ground	

7.I.3. Strip P4

P4 - 2	+50 V rough	I_{RMS} 30 A.(1100 lpm - 160 col.)
P4 - I	-50 V "	

7.I.4. Connector J4

+24 V CAVE	Supply CT2 - CT3
POTE I POTE	Series magnetothermal protections MOC I5I/C
MARI CORE	Command of the motors triac driving relay
MARI COBO	Breaker driving CTI

CAAP CAAP I	Power supply + 24VDC conditioned by the microswitches of enclosure shuting.
MARI	Cable shield
MOSUN + 20	Top ribbon transport motor command
MOBAN + 20	Bottom ribbon transport motor command
COFA COFE	Driving of the 1st paper movement clutch
CODO COSO	Driving of the 1st paper movement brake
CAFA CAFE	Driving of the 2nd paper movement clutch
CADO CASO	Driving of the 2nd paper movement brake
CODU COSU	Driving of the 1st paper movement brake
CADU CASU	Driving of the 2nd paper movement brake
BOCA BOCE	Driving of the clutch for the transport of the top CMC7 ribbon
BOCI BOCO	Driving of the clutch for the transport of the bottom CMC7 ribbon

7.2. Interface ATA 140

The ALI 310 interfaces with the ATA 140 through the connector J5 and the strip P4.

7.2.1. Connector J5

OFF 2	OFF command from the table
COCO	24 Vdc common for the commands
ON 2	ON command from the table
LAOF	+24V, it lights the yellow part of the button OFF
LAON	+24V, it lights the 1st part of the button ON

LION	+24V, it lights the 2nd part of the button ON
LAAL	+24V, it lights the ALERT signal on the table
TERI	back ground of the lamps in the buttons ON and OFF
SOFEA	+5V with equipment in OFF
SOFE1	0V with equipment in OFF
TATOA	+5V with equipment in OFF
TATO1	+5V with equipment in OFF
COZE	conditioned zero. It enables the turn on of the lamps on the table. Floating with equipment in OFF
FOTE	technological forcing. For the hammer-drive boards it is significant at 0V;floating with equipment on
FIRI1	end-of-charge. Significant at logical level 0
INCAN	beginning-of-charge. Significant at logical level 1
VARI 2	charge validation. Significant at logical level 0
MARI	referance ground
+ 20	+20V voltage from CPU
MOSUN +20	top ribbon motor driving
MOBAN + 20	bottom ribbon motor driving
+ 20 REMA	RL 21 driving
FISU 1	command to the top ribbon movement clutch. Significant at logical level 0.

FIBA 1	command to the bottom ribbon movement clutch. Significant at logical level 0.
MAT 11	paper movement command on the 1st transport. Significant at logical level 0.
MAT 21	paper movement command on the 2nd transport. Significant at logical level 0.
CMC7A	signalization of CMC7 equipment preset for normal printing.
CMC71	signalization of CMC7 equipment preset for CMC7 printing.

7.8.2. Strip P4

P4 - 3	+60V pulse
P4 - 4	-60V pulse (ground)

8. Testing rules

Testing comprises five steps:

- testing of half module secondary voltages
- testing of service and command modules
- testing of cyclic ALI
- testing of FRIZ board
- testing of OPZ 311

8.1. Half module test

8.1.1. Ohmic test

Check the exact correspondence between cabling lists and cablings, particularly check if there is no short circuit between the terminal pins X - Y - Z (1-2-3) of the strip P2, and check exact value and integrity of the fuses F1 ÷ F3 and F4 - F5.
Check if there is continuity between the terminal pins 4 and 5 of the connector J2 (termoswitches' circuit).

8.1.2. Powering on

Connect triphase mains 220 - 50 Hz (208 - 60Hz) to the strip P2.

- Check on connector J2 that there are the following voltages:

  between terminal pins 1 and 2 75V ± 10%
  between terminal pins 2 and 3 75V ± 10%
  between terminal pins 1 and 3 75V ± 10%

- Put the switch S3 on position 3 and check if there is direct voltage of 5,25V between terminal pins 1 (-) and 3 (+) of strip P3.
- Apply a load of 10,8A ± 10% on terminal pins 1 and 3 of P3; bring cursor of RV1 to end 1, check if output voltage is 3V.

Said voltage must not exceed the tollerance of 2,46 ÷ 2,64V also if mains voltage is 190V and 250V.

8.2. Testing of service and command modules

8.2.1. Ohmic test

Check the exact correspondence between cabling lists and cablings.
Check the exact value and integrity of the fuses F6 - F7.
Check if there is no short circuit between the terminal pins X - Y - Z (5-6-7) of P1.

8.2.2. Powering on

- Connect half module secondary voltages already tested as per drawing 78A101661 and 78B101723.
- Carry out the following strappings:

  strap terminal pins 4-3 and 4-4 of J1

  strap pin X and W of J4
  These straps simulate chain of termoswitches.
- Connecy normally closed pushbutton between pins V and U of T4 which simulates opening and closing of drum.
- Connect a normally open pushbutton between pin P of J5 and one of the terminal pins of P8, which simulates switching-off of logic control.
- Connect a direct voltage of +20V between pin k of J5 (+ pole) and one of the terminal pins of P8.
- Connect mains to the terminal pins 5 - 6 - 7 of P1. Switch on pressing the key S2 of ON.
- Check exact switching-on sequence as in section 5.2.1.1

Time tollerances must be the following ones:

- time constant	R9 - C6	50ms	-10% +50%
- time constant	R11 - C7	150ms	-10% +50%
- time constant		3sec	-20% +50%
- time constant	R21 - C10	50ms	-10% +50%

Check the presence of the following voltages:

- 220 - 50Hz (208-60Hz) between terminal pins 9-10-11 of strip P1

- +24V ±10% between J1-2-1 and any point of P8.
- +12V ±10% between J1-2-2 and any point of P8.
- -12V ±10% between J1-2-3 and any point of P8.
- -12VR ±10% between J1-3-5 and any point of P8.

- Switch off voltages pressing key S1 of OFF and check exact switching-off sequence as in section 5.2.1.2. Tollerance on time of 60msec is ±10%.

Switch on again and carry out the following tests:

cut one of the two straps that simulato microswitch chain and check switching-off as in section 5.2.1.2.

Restore the initial conditions.
Margin +20V voltage going down to 15V and check if power supply switches off between 18V and 15V as in section 5.2.1.2.

Restore the initial conditions.
Remove one of the fuses F1 ÷ F3 on the half module of secondary voltages and check if power supply switches off as in "Absence fase control" of section 5.2.1.2.

Restore the initial conditions.
Press pushbutton which simulates opening and closing of drum and carter and check sequence as in section 5.2.1.2.

Strap points 1-2 and 3-4 of Tz, simulate one of these cases, and check if power supply does not switch off.

8.3. Test of cyclic power supply module

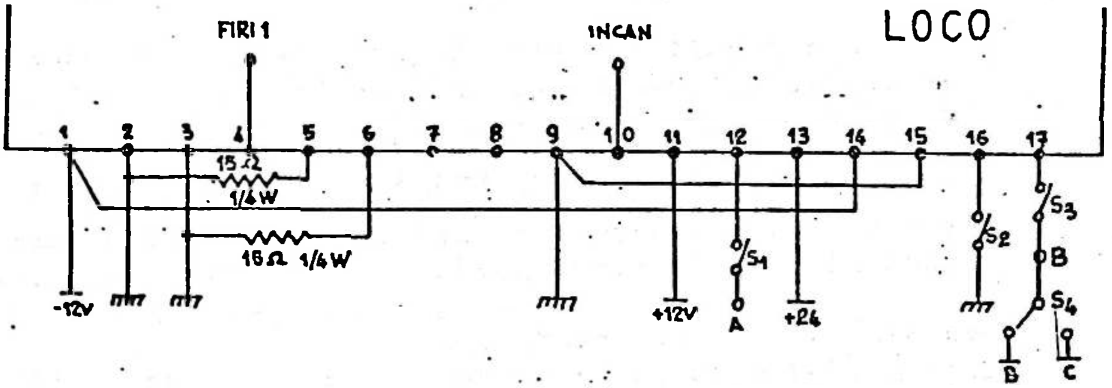
8.3.1. Ohmic test

Check the exact correspondence between cabling lists and cablings.
Check if there is no short circuit between the terminal pins P4-3 and P4-4.

8.3.2. Test of board LOCO

Testing circuit

Lay down a circuit as in figure

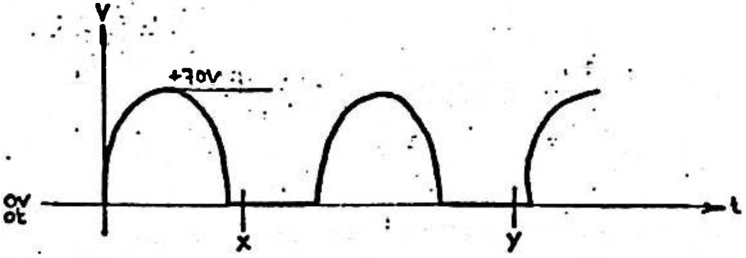


Supply voltages:

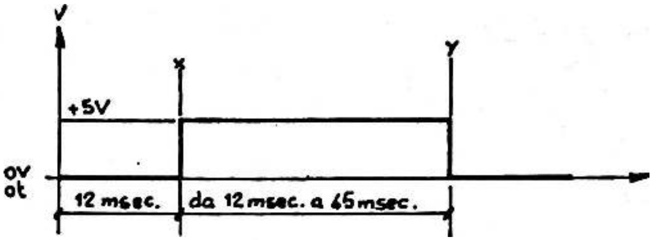
+ 12V ± 0,6V
- 12V ± 0,6V
+ 24V ± 1,2V

Signals:

Ⓐ : simulates voltage supplied by cyclic power supply, obtained from alternated voltage 50 Hz rectified on only one half wave; peak voltage must be +70V.

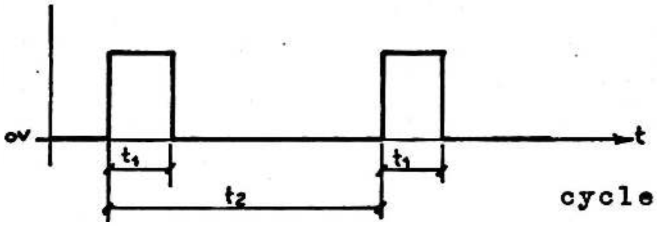


Ⓑ : Signal to apply on B :



cycle : 80msec.

Ⓒ : Signal to apply on C:



cycle : 80msec.

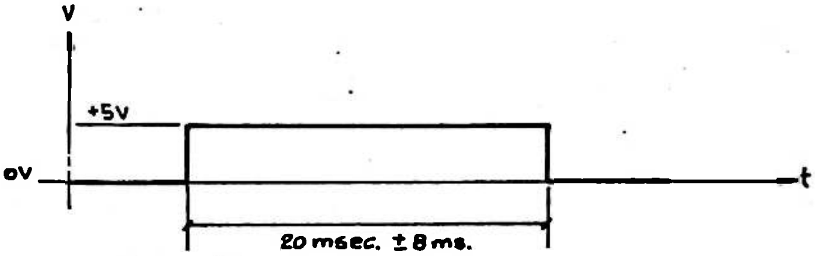
t_1 = from 0,1 to 1 msec.

t_2 = adjustable from 12 to 45 msec.

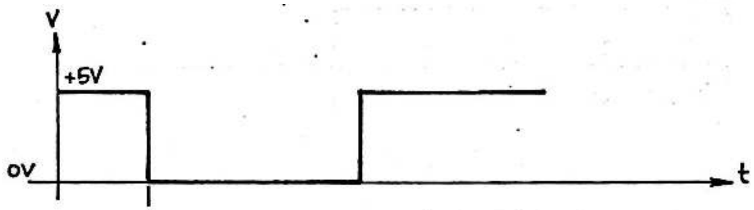
Control and regulation of monostables 1 and 2

a) Switches S1 and S2 open
b) Switch S4 in position B

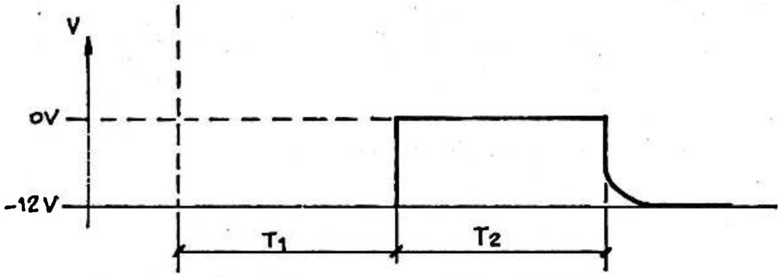
Signal on pin 17 (VARI 2)



Signal on pin 10 (INCAN)



Signal on test-point E

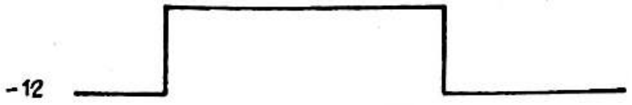


Regulate RV4 until obtaining time T1 = 8,8 ±0,1msec.
and RV5 until obtaining time T2 = 7,8 ±0,3msec.

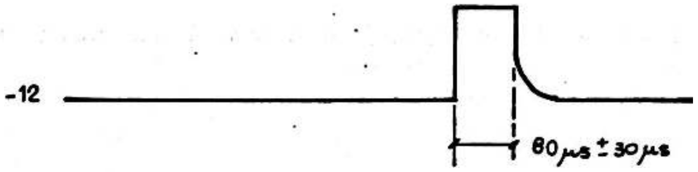
Control of command pulses of the controlled diodes.

Switches in positions as in previous section.

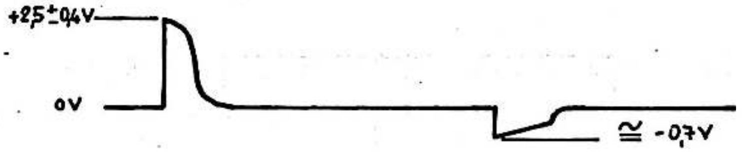
Signal on test-point E



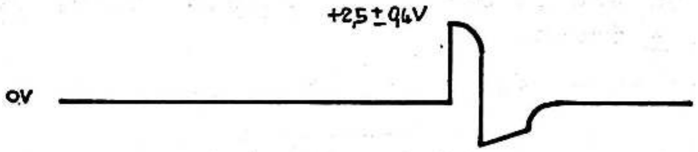
Signal on test-point F



Signal on pin 6



Signal on pin 5



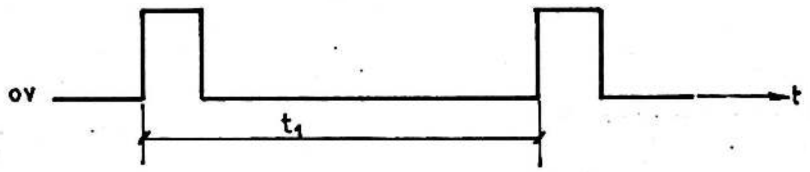
Control of forcing

The switches positioned as previously described, close switch S2; the signals on pins 5 and 6 must not be generated any more.
It is sufficient to check on test-point E if there is a D.C. level of -12V.

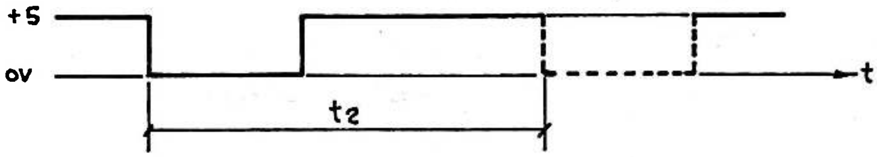
Control of the action of duration of charging command signal (VARI 2) and of the action of duration threshold n°1 of 20msec.

Switches S1 and S2 open, S4 closed in position C.

Signal on pin 17 (VARI 2)



Signal on pin 10 (INCAN)



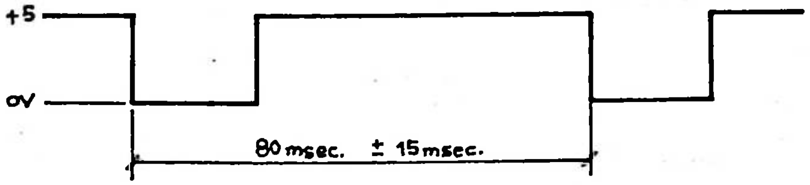
Variate t1 between 12msec. and 45msec.; the second signal on pin 10 must appear when t2 superates 28msec. ± 6msec.

Check if there is no signal at test-point E.

Control of automatic functioning.

Open the switches S1 -S2 - S3.
The signals must repeat with a cycle of 80msec.±15msec.

Signal on pin 10 (INCAN)



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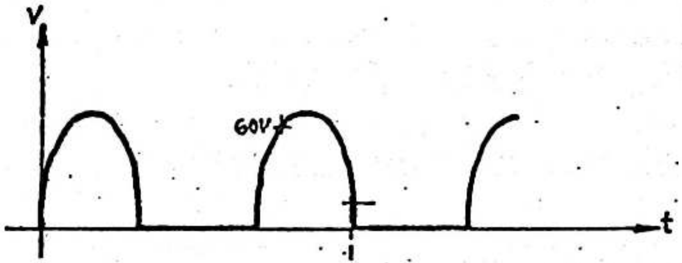
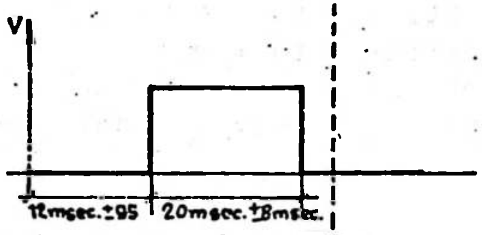
Control and approximative regulation of voltage comparator.

Switches S1 and S3 closed, S4 in position B.

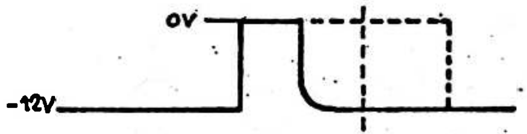
Signal on pin 12



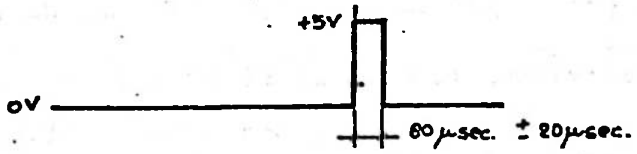
Signal on pin 17 (charging command)



Signal on pin 6



Signal on pin 4 (end of charge FIRI 1)



Adjust potentiometer of the comparator RV3 so that signal on pin 6 goes off when the voltage on pin 12 arrives at about +60V.

Check if end of charge comparator commutates at about 53 - 55V (T.p. L) and consequently the charge validation monostable passes on position work (T.p. I).

The signal on pin 4 must appear when the voltage on pin 12 goes below +13V ± 3V.

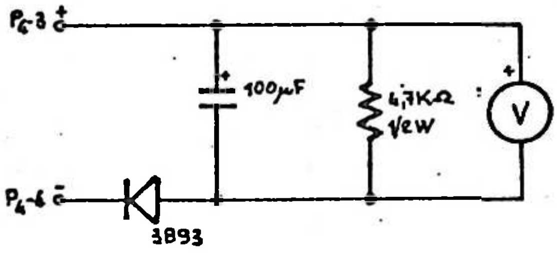
8.3.3. Control of the complete module.

Control of the unloaded power supply and regulation of +60V pulse voltage.

Supply the module by means of the connector J6 with the following voltages:

J6 - 1 - 1	voltage +24V ± 1,2V
J6 - 1 - 2	voltage +12V ± 0,6V
J6 - 1 - 3	voltage -12V ± 0,6V
J6 - 2 - 5	voltage -12V ± 0,6V
J6 - 2 - 1	common voltage (signal ground)

Connect the following circuit to the output P4-3 (+) and P4-4 (-):



voltmeter x D.C.
class 1,5-5000 ohm/V

Connect power ground (P4-4) with signal ground (J6-2-1).
Let unconnected the input of charging command (J6-2-2).

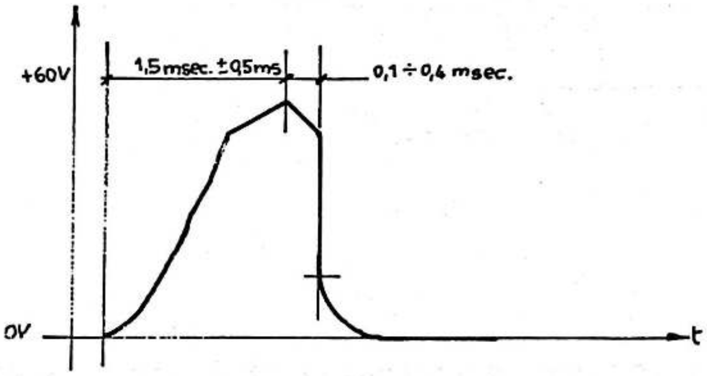
Supply the mains transformer of the simulator with a voltage of 220V ± 2V.

Checks:

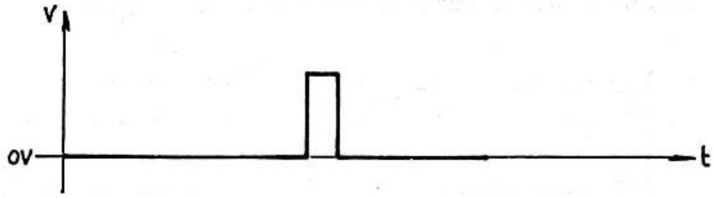
- The power supply must send cyclic charging pulses with an interval comprised within 65msec. and 95msec.

  Regulate the potentiometer RV3 on the board LOCO until you read a voltage of 59V on the voltmeter.

  Signal to observe at the output of the power supply between the sockets Tp 7 (+) and Tp 8 (-).



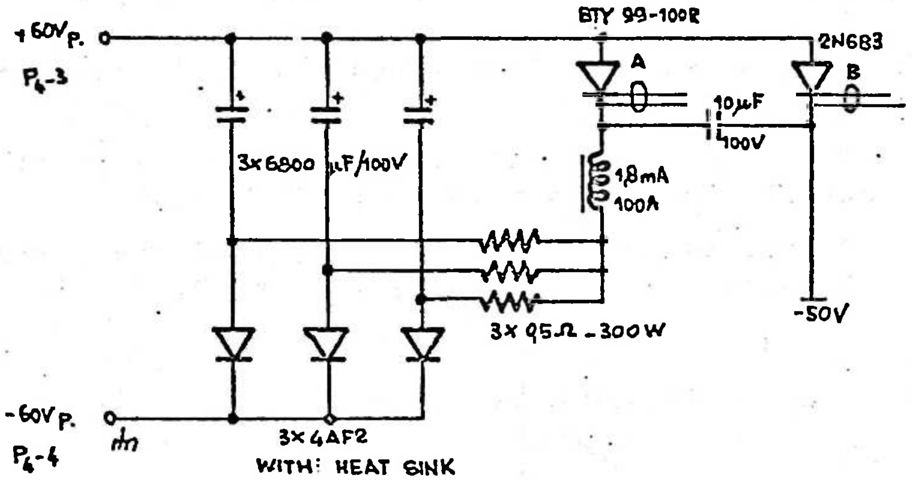
End of charge signal (FIRI 1)



Check if the lamp SL6 flashes.

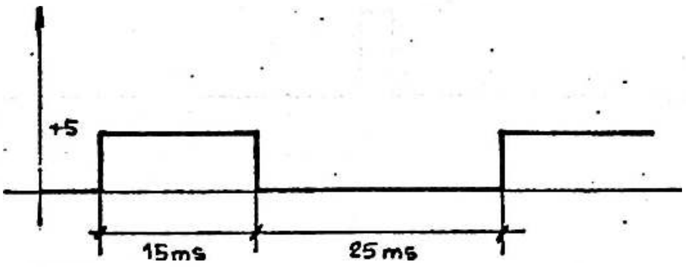
Control of loaded power supply.

Connect the simulator to the output of the power supply:

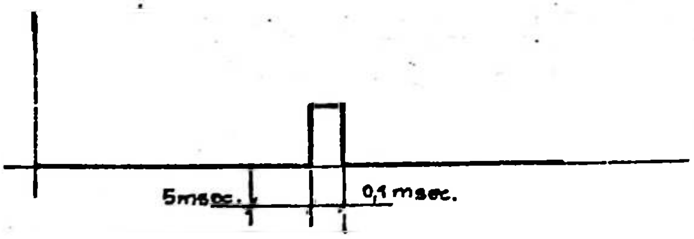


A = command simulating the printing
B = command synchronous with the charging command

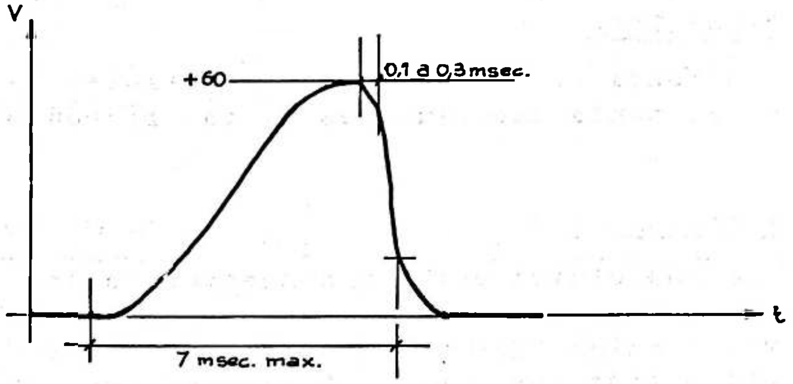
- Signal of charging command Ⓑ



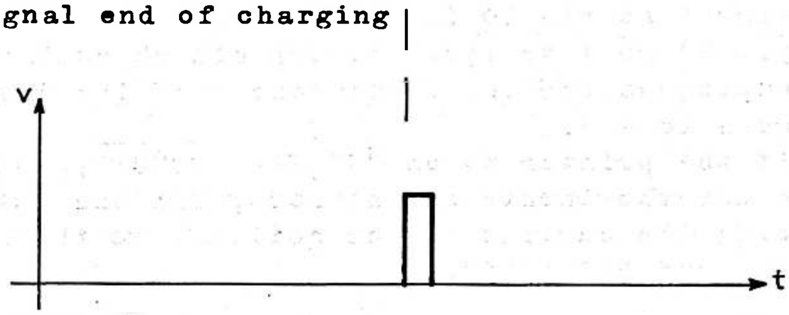
- Signal of discharging command Ⓐ



Control the output wave form:



Signal end of charging



Check the behaviour of the charging voltage during the load-unload sequence,modifying the signal amplitude of the discharging command of the simulator.

There must never be observed a drop and rise of the + 60V voltage during the same charge.

Check correct functioning of the power supply module margining the supply voltages (+12V, -12V, +24V) within ± 15%.

8.4. Test of board FRIZ.

8.4.1. Generality

The board FRIZ is used in the printer I-51 - CMC 7; it commands the clutches of the ribbon movement.

8.4.2. Functioning

The top clutch coil is connected to the pins 4 and 22; the bottom clutch coil is connected to the pins 5 and 3. Functioning "CMC 7", RL 21 is excited and therefore R99 ÷ R105 and R49 ÷ R58 are cut out. When the command signal at pin 19 (equivalent to the complement of pin 7) goes to +5V, the top clutch coil is commanded; analogous for the bottom one when the input at pin 7 goes to +5V.
If the printer is on "NORMAL" ($\overline{\text{CMC 7}}$), RL21 is relaxed: since the inputs are at zero, TR1 and TR2 are turned off; the current in the coils flows through D57 and D58 and R49 ÷ R58.

8.4.3. Electrical characteristics: + 20V ± 2V Ripple 1 Vpp

Supply voltage: from 75 to 100V (nominal 90V) ripple 5 Vpp at any frequence within the permitted band

Absorption max of +90V : 130mA
" max of +20V : 50mA

Inputs: equivalent to 5 loads NOR for both of them.

Output: there must be connected coils with R_{dc} = 443Ω ± 5% to the pins 4→22 and 5→3.

Temperature: range of ambient temperature 10° ÷ 50°C

8.4.4. Testing rules

Having connected the top and the bottom coil control the following points:

Conditions	Checks (for V_A = 90V)
input 7 grounded " 19 at +5V RL21 relaxed	top coil 110mA bottom coil 25mA
input 7 at +5V " 19 grounded RL21 relaxed	top coil 25mA bottom coil 110mA
input 7 grounded " 19 at +5V RL21 excited	top coil 110mA bottom coil no current
input 19 grounded " 7 at +5V RL21 excited	top coil no current bottom coil 110 mA

8.5. Testing rules OPZ 311 (BRAKE - CLUTCH)

8.5.1.. Generality

The command circuit of the brake-clutch of the printer I 51, called OPZ 311, is collocated on the wing B of the power supply in the service module. It has the function of piloting the actuators to execute the new line (or jump).

8.5.2. Functioning of the circuit

The general diagram is contained in the drawing n°78D101727 (BOX 1° paper movement).
To better explain the functioning of the circuit we refer to the drawing n°78D100281 (board FREF) and to the one shown in figure 30.

With device adapter OFF, the board FREF receives the signal of "TECNOLOGICAL FORCING" (pin 18-19) and the +20, and therefore TR16 and TR17 are turned off, while the signal on pin 20-21 is on zero, and therefore TR15 is saturated. When the subsystem is switched on, the forcing disappears and automatically TR17 can conduct, bringing to ON the SCR corresponding to the brake TH2 (figure 30).

The conduction of TH2 causes discharging of C1 on the brake coil: consequently there is a high peak current (~40A) which, after the initial transient, goes to ~300mA. If now the input signal goes up, TR17 is saturated and the SCR of the clutch is put ON. The cathod TH1 which prior to the conduction was grounded, is now at +90V.
This voltage variation at C1 also brings to +90V the cathod of TH2 which turns off, due to the voltage inversion at its terminals. Since the minimum command time to TH1 is 5,5ms, the capaciter C1 can recharge to +90V through R1, D1 and L1 (L1 limitates the peak current). Therefore, when TH1 conducts, TH2 turns off and further C1 recharges, C2 discharges on the clutch coil and in consequence of the connected resistance of the potentiometer there is a more or less high peak current (max 2,87A) which, after the initial transient, goes to max ~200mA.

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The trailing front of the input signal restores, at the end of the command, the condition of TH2 ON and TH1 OFF.

There is an inversion of voltage at the terminals of TH1 caused by the conduction of TH2; C2 recharges through R2 to the voltage of 90V.

8.5.3. Electrical characteristics

a) Supply voltage: +20V ± 2V ripple 1 Vpp at any frequence within the permitted band

+ 90V $^{+\,10\%}_{-\,15\%}$

b) Absorption from + 20V : 45mA max

from + 90V : 7A max and 1A medium for t_{brake} = 45ms and t_{clutch} = 5ms

c) Input : from NOR without other loads

d) Temperature : provided range of temperature 10° ÷ 50°C

8.5.4. Testing rules

A) - Testing of the board FREF.

Before beginning the test of the whole circuit, check if the board FREF operates correctly.

Connect therefore a signal at the input, like in figure 19 (pins n° 20-21)

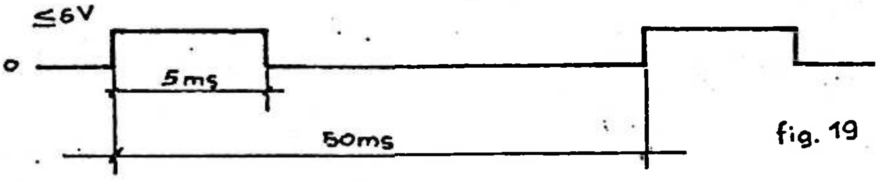


fig. 19

and ground the points 23,24,9,10; check if there is a pulse ≃ 5V with a wave-form similar to the one of figure 20 at the resistance R283 in correspondence with the positive front of figure 19, and at R291 in correspondence with the negative front of figure 19.

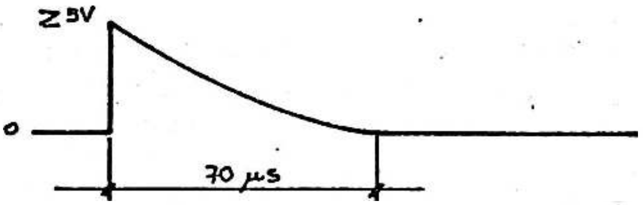


fig. 20

These signals must go to zero if the pin 18 is grounded (tecnological forcing).

B) - Test of the complete circuit

Check all wave-forms (fig.21 ÷ 29) at the various points with input signal of the fig.19. Protect the supply line of +90V with a delayed fuse of 1A so that there will not be any damage in the circuit, if by mistake remain ON simultaneously D32 and D33. Carried out these controls reduce signal time (fig.19) to 4,5 ms and check, observing the current at the brake, that everything is running well.

NOTE: The regulation potentiometer permits to reduce the peak current in the clutch according to the needs. It has to be regulated for the paper movement group, defined by the conditions illustrated by the PDS of the meccanics.

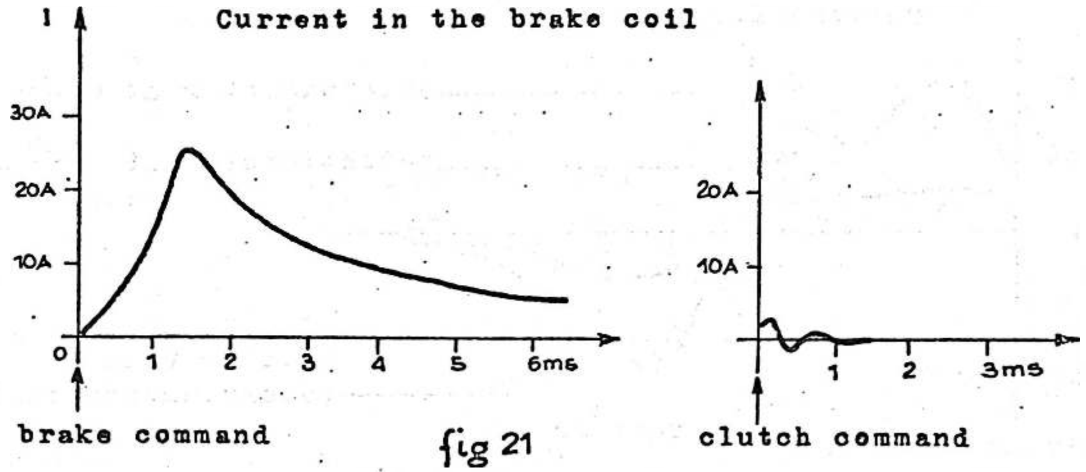

Current in the brake coil

fig 21

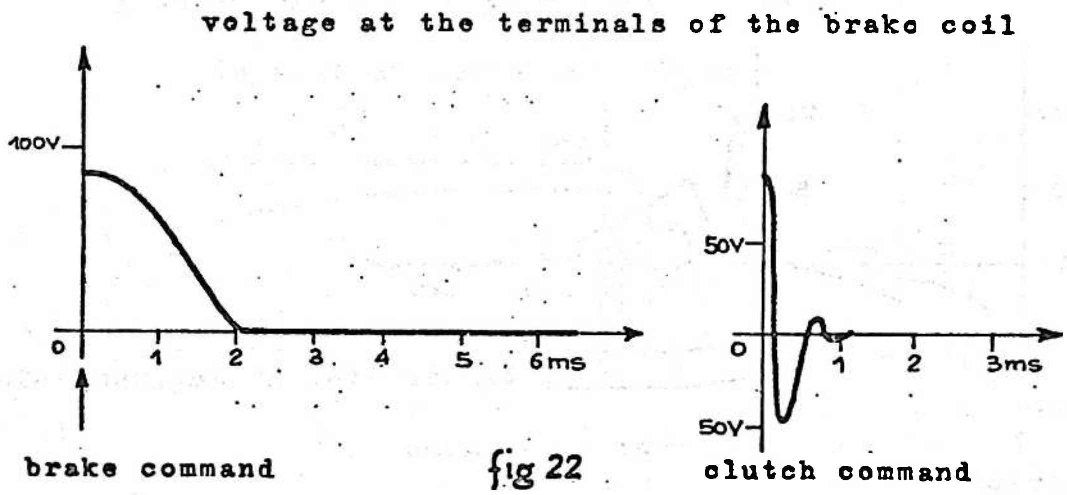

voltage at the terminals of the brake coil

fig 22

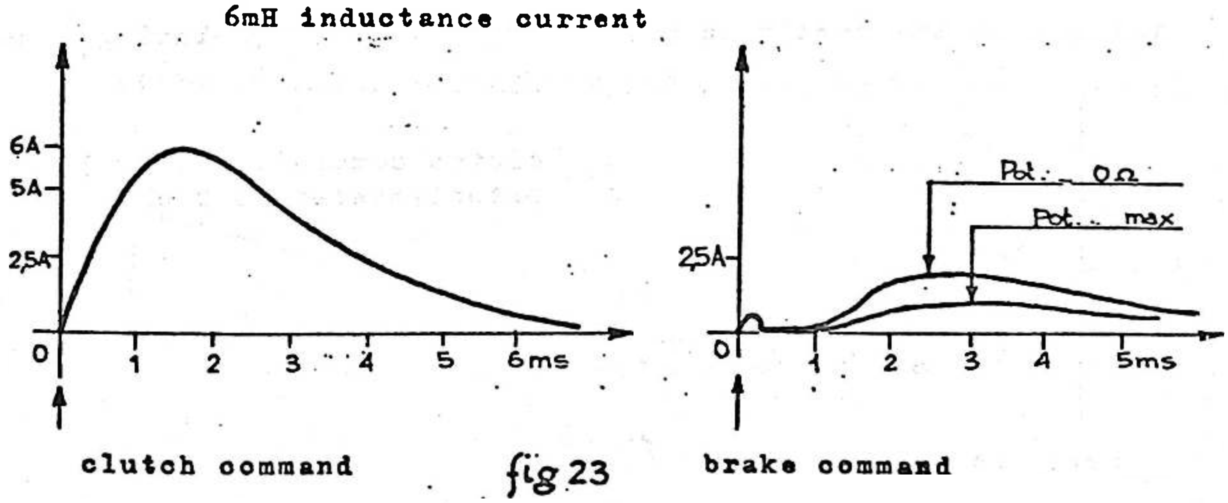

6mH inductance current

fig 23

Current in the clutch coil

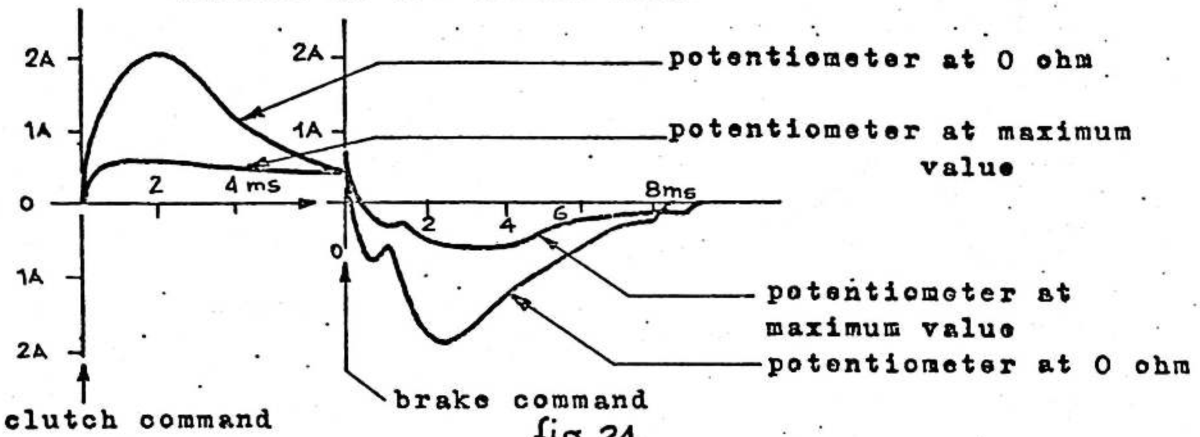


fig 24

Voltage at the terminals of the clutch coil

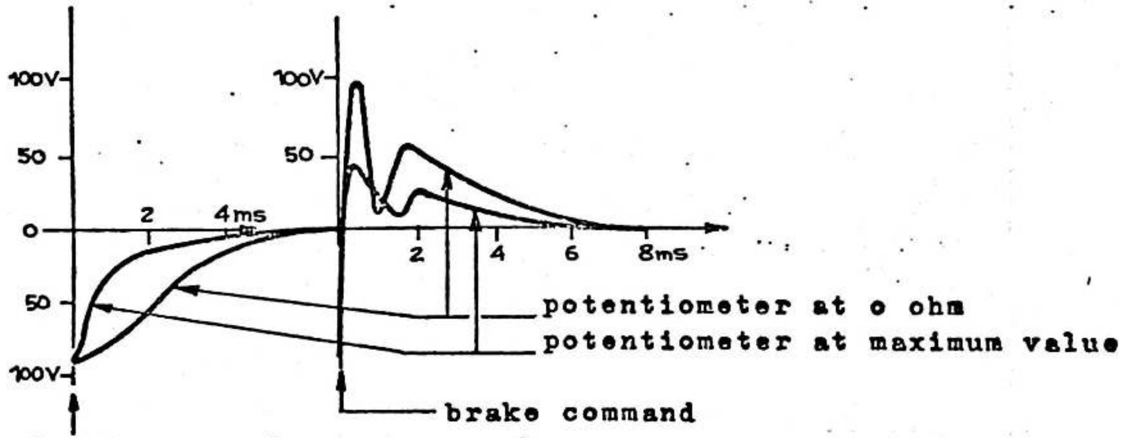


fig 25

Voltage at the terminals of SCR of the clutch (relaxing time)

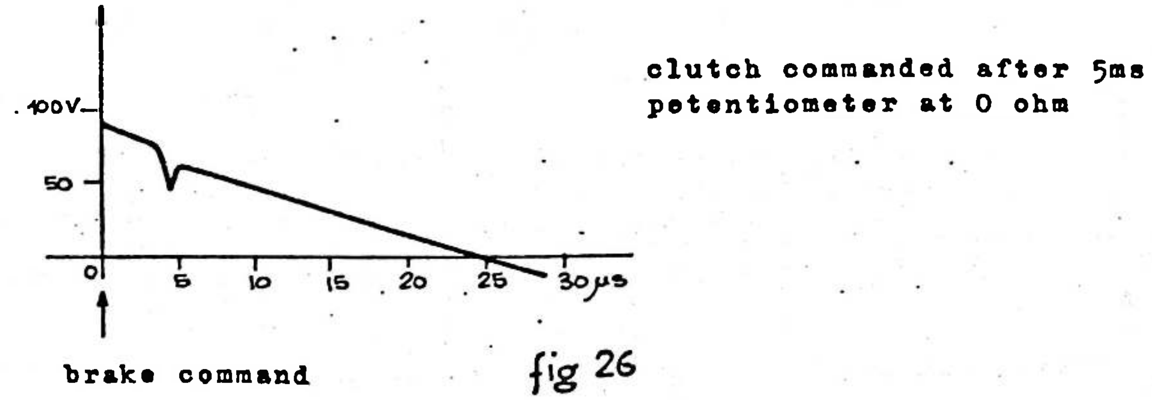


fig 26

Voltage at the brake capacitor

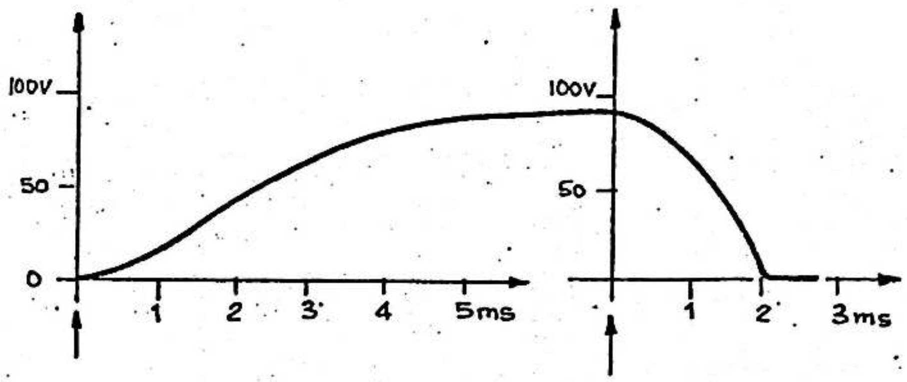


fig 27

Voltage at the clutch capacitor

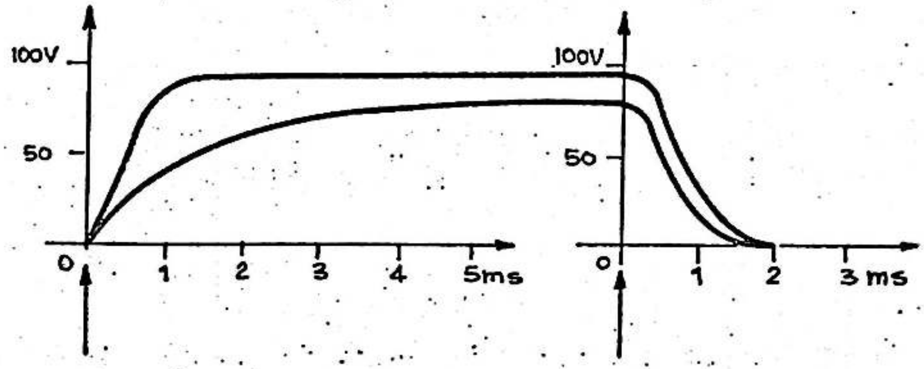


fig 28

Voltage at the ~~terminals of~~ SCR of the brake (relaxing time)

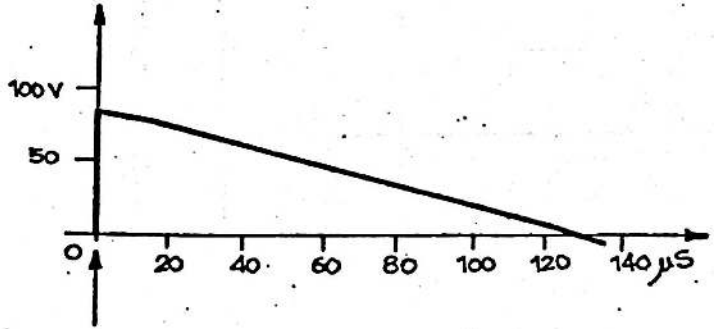
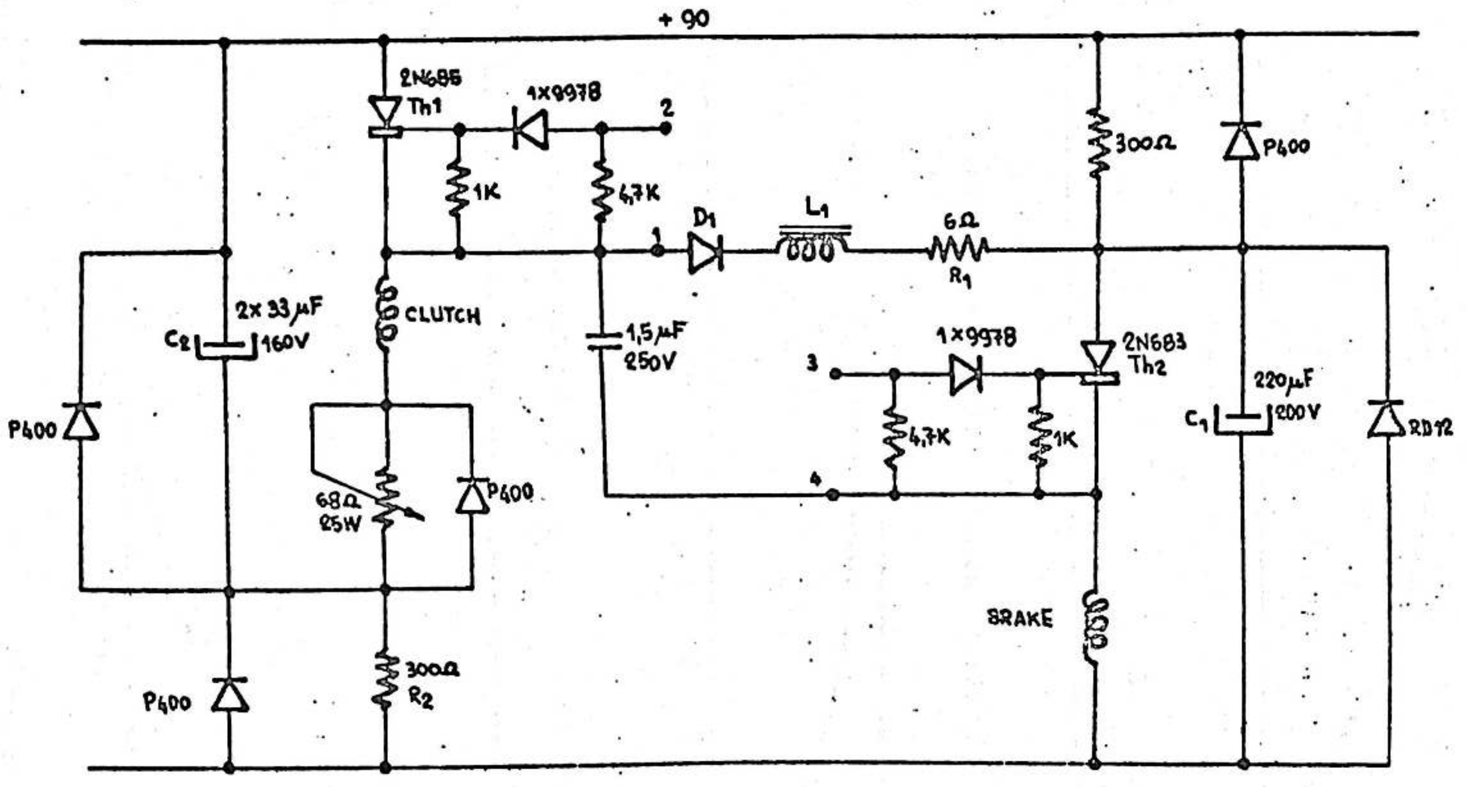


fig 29



CLUTCH BRAKE CIRCUIT

fig. 30

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9. Adjusting

9.1. Secondary voltages module

RVI It acts on the 2,5V voltage which supplies the lamp of the photoreading optical groups.

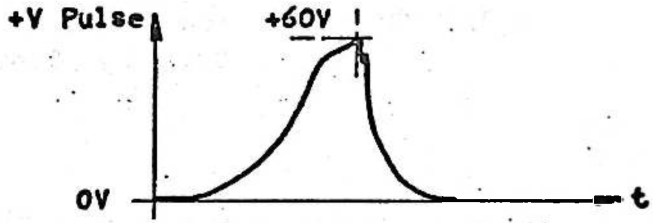
With the subsystem in on and printer in regular ON, adjust RVI until the voltage reading, on the strip P3 of the MOC I 5I/C, is 2,5V.

9.2. BOX paper movement OPZ 3II

RV 2 It regulates the current in the transport clutch. For further inf, see PDS n. 78 A IOI868 (ATA I40) sheet 43.

9.3. Cyclic power supply module

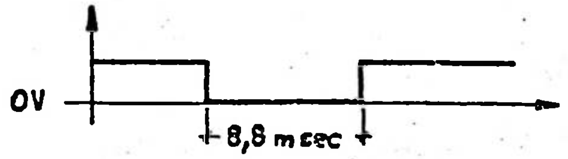
RV 3 Board LOCO. It regulates the peak charge voltage of the printing capacitors.
With subsystem on and printer in STAND-By, turn RV3 until the peak voltage is +60V



OSCILLOSCOPE : Probe : Test Point Tp 7 (+)
Ground: Test Point Tp 8 (-)

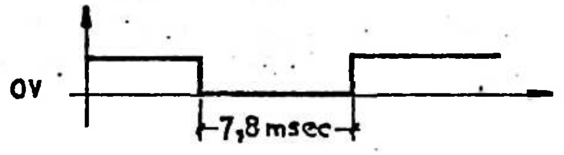
RV 4 Board LOCO. It regulates the time of the monostable n. I

With subsystem on and printer in STAND-BY, turn RV4 until the time is 8,8 msec.



OSCILLOSCOPE : Probe : Test Point (C) pwb LOCO
Ground : Test Point (M) pwb LOCO

RV 5 Board LOCO. It regulates the time of the monostable n. 2
Cut off, on the commands and services module, the cyclic power supply protection, by inserting a shorting bridge between the points 3 and 4 of the connector J7.
Take away the fuses on the primary winding of the power transformer sitting in the printer.
With subsystem on and printer in STAND-BY, turn RV5 until the time is 7,8 msec.



OSCILLOSCOPE : Probe : Test Point (D) pwb LOCO
Ground : Test Point (M) pwb LOCO

After the adjustment, and with the subsystem off, put again the fuses and take away the bridge

10. Referenced documents list

10.1. In these PDS the following documents are referenced:

dwg.	##	78B101892
"	"	78B101991
"	"	78B101707
"	"	78B101995
"	"	78D101726
"	"	78D101727
"	"	78B101882
"	"	78D101710
PDS	"	78A102793 of the ATA 140.

7

INSTALLATION

Honeywell
Honeywell Information Systems Italia

I 51-C

PARALLEL PRINTER SUBSYSTEM

(PRT 142-143-144-145-146-147-148-149-163-166-168-169)

Installation

Second Edition

A Field Engineering
publication

4.836.0.001.1/A

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1. INTRODUCTION

The purpose of this manual is to outline the operations required to install an I51-C printer subsystem.
The hereby set out description presumes that the site has been adeqautely prepared according to the requirements quoted in the Site Preparation manual but do not directly consider the single system configuration; in-fact, the installation engineer and/or team will draw all the necessary details from the following 2 auxiliary documents, individual to each installation :

a) - Site Layout

Giving the collocation of the subsystems in the site and showing those accessories which, though not normally supplied with the subsystems, are necessary to overcome particular space or operative problems.
(i.e. - extra low level cable ducts, troughs, etc.).

b) - Unified Subsystem Connections (USC)

The forms bearing the above name give information upon the connection of the subsystem to :

- CPU - MPA or MPS connectors
- AC supply breakers
- Centralized DC Power Supply
- Fan supply and control terminal strip
- AC supply control circuit.

A detailed description on how to use the USC forms, which also give details on the insertion of calibration plugs and terminator boards, will be found in the CPU Installation manual (P.N. 4.625.0.000.0/A).

The final subsystem check-out must only be carried out if all the system structural and electrical connections have been completed and if the CPU and program loading subsystem check-outs have been accomplished.

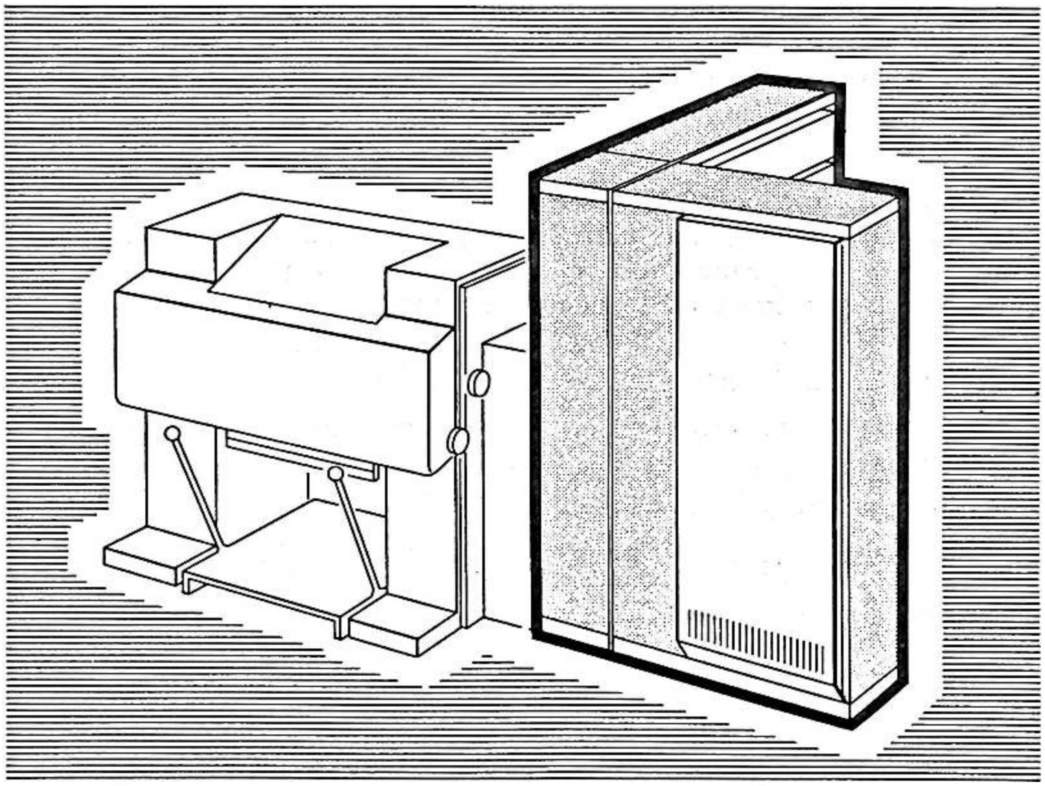


Fig. 1.1 – I51–C Parallel Printer

2. TOOLS AND INSTRUMENTS

The operations to be performed during the installment of this subsystem may be carried out with the aid of the following equipment :

- engineer's tool kit
- site tools.

3. ACCEPTANCE AND COLLOCATION

3.1. - PACKING

- The subsystem, and its pertinent accessories and documentation, is normally shipped in two crates.
- External to each package crate are affixed forms which bear :
  - . the contents of the crate
  - . the guide to uncrate and remove from the battened transport base ("Pallet" or "Shipping skid").

3.2. - ACCEPTANCE

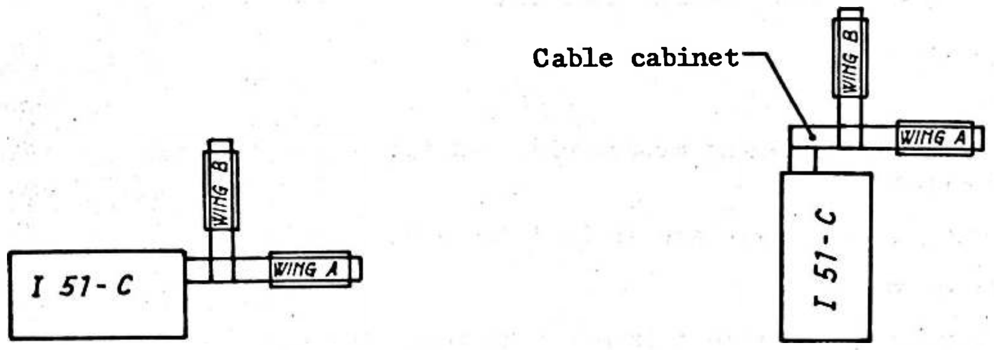
- Upon receipt, all packages are to be visually examined for damage and if any damage is revealed, it will be necessary to :
  - . have the carrier witness the entity of the damage
  - . submit an immediate detailed report to the district manager
  - . fill-in any enclosed shipping forms.

3.3. - UNCRATING

- Ensure that the subsystem is uncrated as per rules set out by the uncrating guide attached to the outside of the crate and that the contents tally with the description.
- Remove the documents and accessories contained in the crates and neatly set them aside so as not to impede the installation operations.

3.4. - COLLOCATION

- Once uncrated, and it has been assured that all equipment is accounted for and no damage was sustained, proceed to place the subsystem as per site lay-out plan.
- The printer can either be connected "in line" with or at "right-angles" to Wing A. Refer to illustrations 3.1.a) and b) on the following page.



a) Aligned with Wing A

b) 90° With Respect to Wing A

Fig. 3.1. - I51-C Installation Arrangement

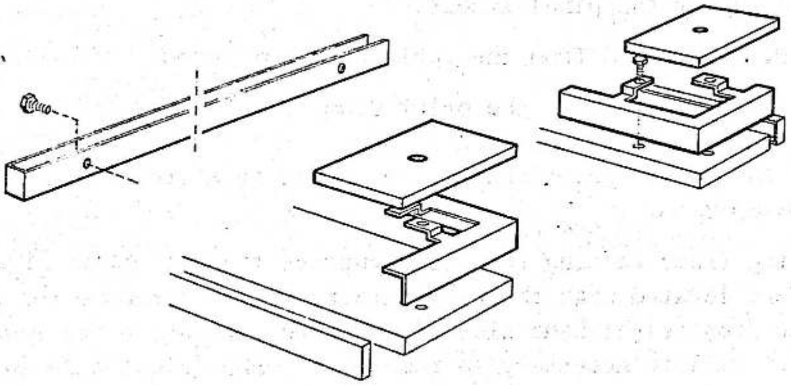
The position of the I51-C printer, with respect to Wing A, is shown on dwg. 76B111630.

- Set aside all those parts used for shipment, holding them for subsystem withdrawal operations. See par. 9.
- Remove all panels and covers from Wings A and B.

4. MECHANICAL ASSEMBLY

4.1. - I51-C PRINTER

- Open the rear panel (access to the print modules) by removing the lock screws located at the top of the panel itself.
- Remove cover P.N. 217600 Z from the cable duct box output end.
- Referring to fig. 4.1., remove the print drum lock bar ③ and fix it in position as illustrated in the mentioned figure.
  This bar will enable the print drum to be opened to a greater extent than its normal aperture angle.
- Remove the 3 top frame casting to main structure transit posts ①.
  Two of these are located near the rear dampers while to remove the other post, located on the front right hand side of the mechanics above the Power Supply transformer, it will be necessary to remove the front right side support cover and top right mechanics panel.
  In order to remove this last panel, first draw out the PAPER THICKNESS knob, by loosening the pertinent set screw.
  When unscrewing the nut on the transit post's pass-through screw, be carefull not to let it drop in the transformer located directly underneath.
- Screw in the 2 rear posts over the dampers on the electronics module support frame holes (see fig. 4.1. - detail A),so as to keep them on hand in case of subsystem withdrawal operations. Refer to par. 9.
- Level-up the mechanics by appropriately rotating the stand-offs②.
- Proceed to fit the printer with the following I51-C "Pieces accomp" Part Kit elements (refer to P.L.76X112175) :
  - . right side support skirting plate (toe plates)
  - . left side support skirting plate
  - . rear skirting plate
  - . right side support cover plate
  - . left side support cover plate
- Assemble the paper support deck (P.N. 383380 Z) and place is in front of the I51-C.



Fixture of Side Support Cover Plates

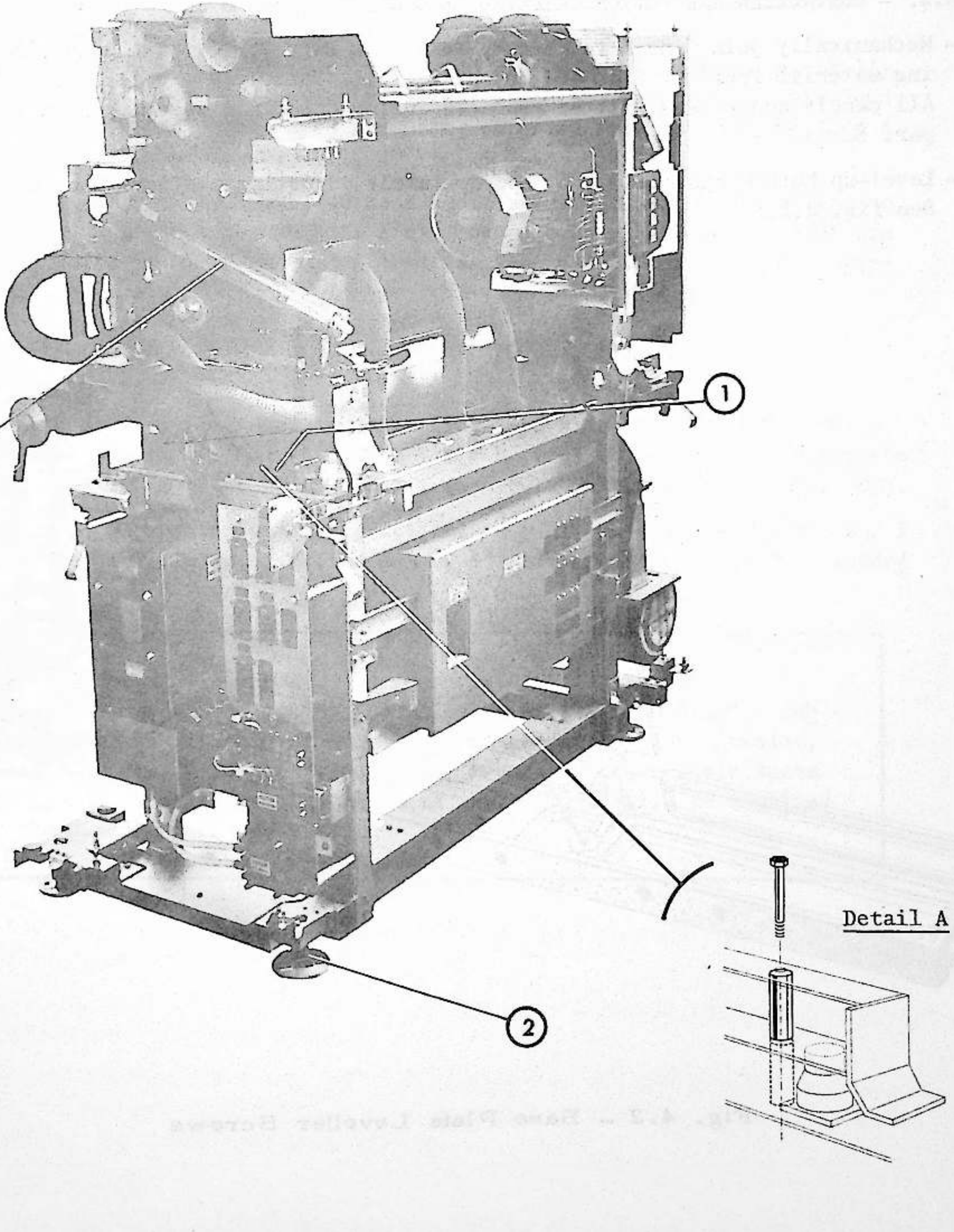


Fig. 4.1. - I51-C Rear View (Deskinned)

4.2. - CONTROLLER AND DEVICE ORIENTED ELECTRONICS (Wing A and Wing B)

- Mechanically join Wing A to Wing B, following Dwg. 78B101644 (sheet 1/2) and using material from kit P.N. 0643203 M (see P.L. 78X101648 - col. G1).
  All panels and covers will be replaced during the final operations phase at par. 8.
- Level-up both Wings A and B by appropriately adjusting the leveller screws. See fig. 4.2.

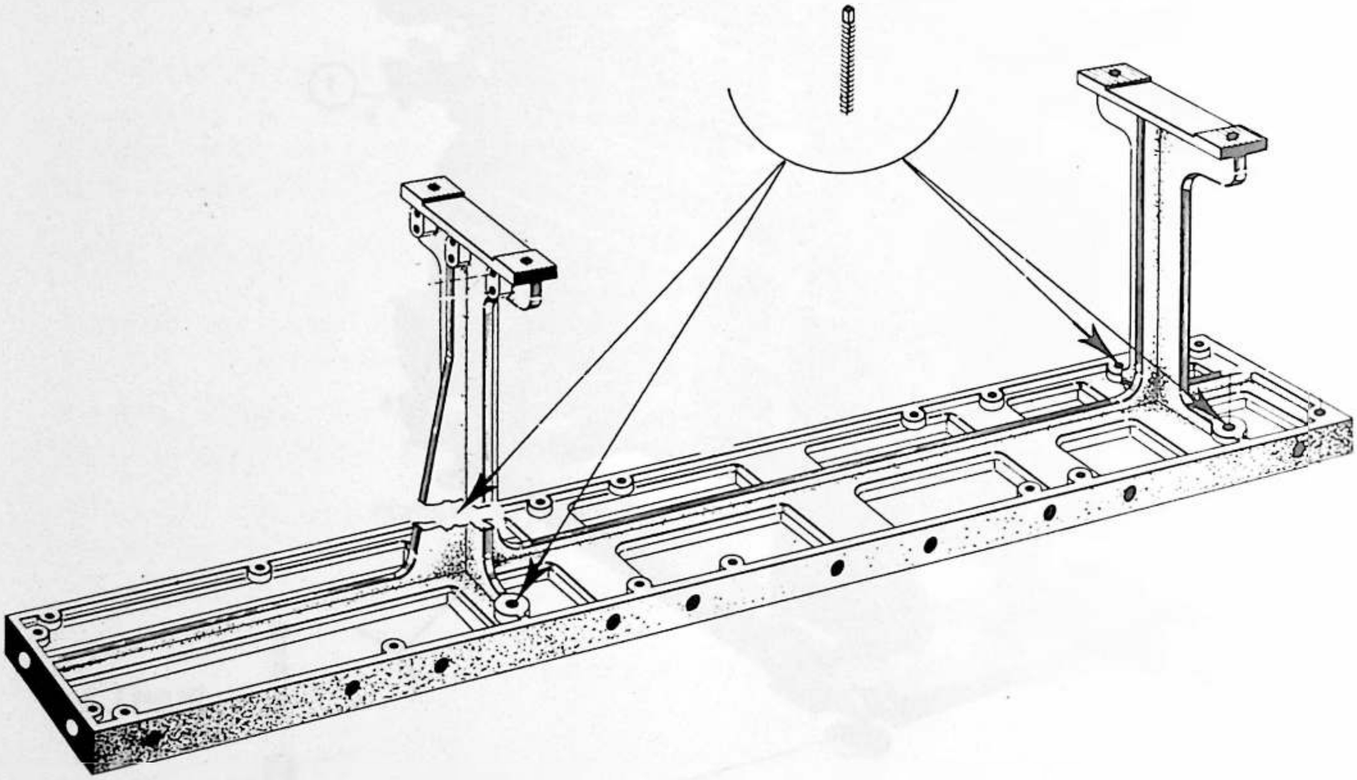


Fig. 4.2 - Base Plate Leveller Screws

4.2.1. - First Printer

- If the subsystem is to be connected to system Wing C, proceed to mechanically join Wing A to Wing C by following the illustration shown on the left-hand side of dwg. 78B101644 (sheet 2/F) and using material from kit P.N. 0643204 A (see P.L. 78X101648 - col. G2).
- If the subsystem is to be installed as a "self standing" unit (connection to the GE 115/1), fit the cover on Wing A as shown on the right-hand side of drawing 78B101644 (sheet 2/F) and using material from kit P.N. 0643205 E (see P.L. 78X101648 - col. G3).

4.2.2. - Second Printer

- Fit the cover on Wing A as shown on the right-hand side of dwg. 78B101644 - (sheet 2/F) and using the material from kit P.N. 0643306 L - for 50 Hz version or kit P.N. 0643307 Q - for 60 Hz version (see P.L. 78X101648 - col. G4, G5).
- The 50 Hz or 60 Hz version breaker, recalled on P.L. 78X101648 - sheet 2 / F (Pos. No 17 and 18), is to be fitted on the 1st site printer's ALI 260 according to the system USC forms.

> Note
>
> In case the machine is to be installed as a "self standing" subsystem and the site has no double flooring, protect the cables, going from Wing A to the system, with the appropriate cable ducts. The needed material and installation instructions will be supplied by the Site Preparation staff.

5. CABLE CONNECTIONS

Untie the cables fixed in the channels of Wing A and Wing B and therefore lay them out.
All I51-C cables will be supplied fixed on one of the subsystem's physical units.

5.1. - CONNECTIONS BETWEEN THE SUBSYSTEM PHYSICAL UNITS (Wing A : Wing B : I51-C)

Locate each connecting point by referring to the markings on the cables themselves and, should difficulties in the interpretation be incurred, by referring to the following drawings and part lists :

- Dwg. 78B101677

  Showing the cable lay-out path from Wing B toward Wing A and the I51-C.
  The drawing also shows the physical position of the appropriate connectors.
  The pertinent connections, regarding cables of dwg. 78B101677, are given on dwg. 78B101670.

- Dwg. 78B101682

  Showing the Wing A to I51-C cable layout path and the physical position of the appropriate connectors.
  The pertinent cable connections are illustrated on dwg. 78B101668.

- P.L. 78X101667

  Listing the part numbers of all the exchange cables (mentioned on drawings 78B101668 - 78B101670) between Wing A, Wing B and the I51-C.

  . Kit P.N. 0643212 E (col. G1) is pertinent to a standard character printer.

  . Kit P.N. 0643213 A (col. G2) is pertinent to a CMC7 and newspaper label character printer.

  . Kit P.N. 0643214 X (col. G3) is pertinent to a normal CMC7 and newspaper label character 50 Hz printer.

  . Kit P.N. 0643215 T (col. G4) is pertinent to a normal CMC7 and newspaper label character 60 Hz printer.

  . Kit P.N. 0643308 D (col. G5) is pertinent to the 2nd printer in the site. No ALI 260 a-c supply cables will be supplied with the 2nd site printer, as the ALI 260's will not be utilized.

- Dwg. 78A101602

  Showing the cable connections for subsystems fitted with the 2nd paper movements.

To ease connection operations it is advisable to first start connecting cables from the bottom of the I51-C printer and then working toward the top, fixing the print module cables first.

- Secure the cables along their path with the appropriate clamps, avoiding any excessive bending.
  Check that the print module cables are held fixed by the appropriate clamping strips (dwg. 78B101682).
- Maintaining the pins aligned, and just introduced in the appropriate sockets, alternately tighten the connector fixing posts without excessive force so as to avoid breakages.
- Finally, position the cable connected to the I51-C in such a way as it results free to move when opening the print drum.

5.2. - SUBSYSTEM TO SYSTEM CONNECTIONS

Locate each connecting point by referring to the cable markings themselves and, for those bearing symbolic markings, by consulting the system USC forms.

In case a cable check-out is to be carried out, or should difficulties in the interpretation of markings be encountered, consult the following drawings and part lists.

5.2.1. - First Printer

- Dwg. 78B101676

  Shows the cable layout path between Wings A and C (or MPA in cases of Standard Controllers) and the physical position of the connectors on Wing A.
  The drawing holds true for both the GOC 100 integrated controller and the GOC 200 + MEM 170 standard controller.
  The pertinent connections, regarding cables of Dwg. 78B101676, are shown on dwg. 78B101672 (Integrated controller) or dwg. 78B101673 (Standard controller).

- P.L. 78X101671

  Lists the part numbers of all the exchange cables (mentioned on dwgs.78B101672 and 78B101673) between Wing A, Wing B, Wing C (or MPA in cases of STD controllers) and the TAV 420/460.

  . Kit P.N. 0643217 B (col. G1) is pertinent to the standard controller printer.

  . Kit P.N. 0643218 Y (col. G2) is pertinent to the integrated controller printer.

5.2.2. - Second Printer

The 2nd printer in the site may be connected to the CPU in one of two ways :

1) - Directly to the standard CPU connector or through an MPA

- Dwg. 78B1012204

  Shows the cable layout path between Wing A and Wing C (or MPA) and the physical position of the connectors on Wing A.
  The pertinent cable connections are given on dwg. 78B102197.
  For cable connections from the CPU side, consult the USC forms.

2) - Connection to standard CPU connector through the manual peripheral switch MPS

- Dwg. 78B102205

  Shows the cable layout path between Wing A and the MPS and also the physical position of the connectors on Wing A.
  The pertinent connections, regarding cables of dwg. 78B102205, are given on dwg. 78B102198.
  For cable insertion from the MPS side, consult the USC forms.

- P.L. 78X102196

  Lists the part numbers of all the exchange cables (mentioned on dwgs. 78B102197 and 78B102198) between Wing A and the CPU or MPS standard connector.

  . Kit P.N. 0643309 H (col. G1) is pertinent to the connection described at par. 5.2.2. - 1).

  . Kit P.N. 0643310 T (col. G2) is pertinent to the connection described at par. 5.2.2. - 2).

5.3. - INSERTION OF WING C TERMINATOR BOARDS

Standard controller printers require the fitment of terminator boards TAPO - B and TACA - A on the CPU.
These boards are supplied with kit P.N. 0643217 B (1st site printer) or kit P.N. 0643309 H (2nd site printer).

Terminator board TAPO-C, for integrated controller printers, is included in the CPU kit.

To trace the position in which these boards have to be inserted, consult the USC forms - Table "L".

5.4. - PRINTER CONNECTION TO GE 115/1

The details specified in par. 5.2. are not to be taken into consideration. Insert dwg. 4.072.0.521. (Integrated controller subsystems) and dwg.4.072.0.523. (Standard controller subsystems), drawn-up by the Site Preparation staff, in the subsystem documentation folder in place of dwg. 78B101672 and 78B101673 or 78B102197, respectively, and appropriately update the FCO Status Log.

Nota

Drawings 4.072.0.521 and 4.072.0.523 have merely been attached as example drawings of the most probable PRT to GE 115/1 connections. For actual installation purposes, always use drawings issued by the Site Preparation Office.

6. VISUAL CHECKS

6.1. - PRINTER (I51-C)

- Check for a correct damper action by opening and closing the print drum.
- Manually rotate the print drum and check for complete free movement.
- Verify for correct functioning of all the control (adjust) knobs and tractor assembly shaft release.
  Manually rotate the splined tractors shaft to see that it is completely free from binds.
- Fit the paper output chute on the rear side of the printer.
- Place the paper stacker behind the printer.
- Pull out the paper stacking unit cable, from the left hand side of the printer's toe plate, and plug the stacker into its appropriate supply socket.
- Mount the inked ribbon, the anti-smudge strip (in correspondence with the print drum), VFU loop and load the paper.
  (All these items are supplied with the printer - refer to par. 8.1.).

6.2. - CONTROLLER AND DEVICE ORIENTED ELECTRONICS (Wing A and Wing B)

- Check Wing A for :
  . no bent or broken pins
- Check the ALI 310 (on Wing B) for :
  . correct insertion of the special boards
  . correct fitment of relays and fuses.

7. CHECK-OUT

7.1. - OFF LINE CHECKS

The hereby listed checks are only to be carried out if the entire system mechanical assemblies and electrical connections have been completed.

- Fit the VAR 591 relay (located beneath the ALI 260) on Wing B, as shown on the USC form - Table "P".
- Set the printer breaker to ON.
- Power-up the CPU with both a-c and d-c voltages and check that :
  - . the fans of Wing A rotate
  - . fans H2 and H3, located on the central and lower ALI 310 modules, rotate
  - . the yellow OFF lamp, on the I51-C operator panel, lights.
- Depress the operator's panel ON pushbutton, and check that :
  - . the STAND BY lamp lights
  - . the cyclic Power Supply lamp pulses
  - . fan H1, located on the half upper ALI 310 module, rotates
  - . the skip, spacing and photodisc cell lamps light.
- Ascertain that the print drum, paper transport and fan motors rotate.
- Verify that the paper transport mandrel, located before the tractors, rotates in such a way as to cause the paper to move upward.
  Should this not be the case, swap-over two phases on the mechanics P1 terminal strip. See cable C3, recalled on dwgs. 78B101670 and 78B101677.
- Open the print drum and check for the following events :
  - . the drum and skip motors must halt
  - . the OFF lamp (operator panel) must light.
- Close the print drum and check that subsystem power is regained (STAND - BY lights).
- Check the +60 voltage as per Maint. Manual (P.N. 4.836.4.001. /A) Routine 4.3.

7.2. - OPERATOR PANEL COMMANDS CHECK

With the subsystem in the STAND-BY ("Manual") condition, proceed as follows :

- Depress PAPER

  A skip to loop track 7 must occur.
  If no loop is fitted (NO SKIP lamp lit), skipping will persist till the NO SKIP pushbutton is depressed.

- Depress NO SKIP

  The pertinent indicator lamp must light.
  With the said indicator lit, depress PAPER and check that the printer performs a spacing and not a skip.

- Depress OPERATE

  STAND-BY must extinguish and the OPERATE indicator must light.
  Ascertain that, with the subsystem in this condition, the PAPER pushbutton is disabled.

7.3. - ON LINE CHECKS

These checks, implemented through diagnostic programs, are only to be carried out after the CPU and program loading subsystem final check-out operations have been accomplished.

- Feed the tests through by following the instructions on the actual diagnostics themselves.
- Should a diagnostic program give rise to an error halt, before attempting any troubleshooting procedures, first verify the correct punching of :
  - . the site composition card - with the Diagnostics,Organization manual
  - . the diagnostic cards - with the Control Program.

8. FINAL OPERATIONS

8.1. - SKIN-UP

- Check that type, serial number and product code (on the yellow label) correspond to the description given on the "Product Composition Sheet".
- Replace all Wing A - Wing B panels and covers. Also refer to dwg. 78B101644.
- Replace the mechanics covers, previously removed during the installation procedures, and right and left side support rear covers (P.N. 217732 Z and 217743Z respectively), which are supplied disassembled.
- Fit panel P.N. 217600 Z on the cable output side of the printer in such a way as it contacts the cable duct between Wings A and B.
  Refer to dwg. 78B101644 - detail 6.
- If the printer is to be placed at right angles to Wing A, fit the cable cabinet (supplied with kit 76B111630) to the printer's cable duct box output panel P.N. 217600 Z; should this latter not be already predisposed, perform the appropriate drill-out operation.
  Adjust the cable cabinet's stand-offs to bring the cabinet to the same height as the panel to which it will be fixed.
  Refer to dwg. 76B111630.

8.2. - CHECKS AFTER HANDOVER TO CUSTOMER

- Check that the subsystem drawings and their updating indices, shown in the subsystem folder, correspond to those given in the "Product Composition Sheet".
- Transcribe the relevant indices on the F.C.O. Status Log.

> Note
>
> Those drawings having several sheets with the same drawing number, are shown on the Product Composition Sheet with the highest updating index.
> On the other hand, the FCO Status Log must show the index of each sheet.

- Check that the supplied spare parts correspond to those shown on lists :
  - . 15024682 - Wing A and Wing B
  - . 429183 - I 51-C

- Check that all the subsystem special tools and accessories correspond to those listed on P.L. 76X112176.
  - . Column G1 is pertinent to the STD 104/120/136 col. printers
  - . Column G2 is pertinent to the STD 160 col. and Newspaper Lab. printers
  - . Column G3 is pertinent to the CMC7 printers.
- Prepare a report giving details of snags or defects found during the installation.

9. WITHDRAWAL

When a subsystem is to be withdrawn from a site, it must be removed complete of all the kits that were originally consigned.

9.1. - OPERATIONS

- Remove all subsystem power.
- Remove all covers and panels from Wings A, B and C.
- Remove the covers from the central upright cable duct located between Wing A and Wing B.
- In case of 1st site printers, remove the breakers furnishing AC power to the other subsystems. For useful information, refer to the USC forms.
- Remove the printer's :
  - . paper output chute
  - . paper support deck (P.N. 383380 Z)
  - . right and left side support cover plates; right-left and rear side support toe (or skirting) plates, which must all be grouped together so as to restore the printer's parts kit as per P.L. 76X112175.

9.2. - DISASSEMBLY OF CABLES AND MECHANICAL PARTS

- Disconnect all those cables listed in par. 9.2.1. and 9.2.2.
- All the cables that on the following drawings are marked with a cross, are only to be disconnected from the outer side of the physical unit.
  - . Dwg. 78B101668 78B101670 - Wing A, Wing B, I51-C Connection Cables
  - . Dwg. 78B101672 - 1st Integrated controller PRT subsystem cables
  - . Dwg. 78B101673 - 1st Standard controller PRT subsystem cables
  - . Dwg. 78B102197 - 2nd Standard controller PRT subsystem cables
  - . Dwg. 78B102198 - 2nd Printer subsystem to MPS connection cables.
- Clamp all cables within their ducts.
- In case of a standard controller printer, also withold CPU terminator boards TAPO-B and TACA-A (see USC forms).

9.2.1. - Connection Cables Between the Subsystem Physical Units (Wing A, Wing B I51-C)

DWG. or P.L.	STANDARD PRINTER PHYSICAL UNIT KIT P.N.	CMC7 NEWSPAPER LABEL PRINTER PHYSICAL UNIT KIT P.N.
78X101667	0643212 E (50-60 Hz / 1st-2nd printer)	0643213 A (50-60 Hz / 1st-2nd printer)
78X101667	0643214 X (50 Hz / 1st printer)	0643214 X (50 Hz / 1st printer)
78X101667	0643215 T (60 Hz / 2nd printer)	0643215 T (60 Hz / 1st printer)
78X101667	0643308 D (50-60 Hz / 2nd printer)	0643308 D (50-60 Hz / 2nd printer)
78B101668 78B101670 78B101677 78B101682 78B101602	0640194 U (50-60 Hz)*	

(*) - Only for those subsystems fitted with the 2nd paper movements.

9.2.2. - Connection Cables Between PRT Subsystem (Wing A and B) and System Wing C or MPS, TAV 420-460)

1st SITE PRINTER			
INTEGRATED CONTROLLER PRINTER		STANDARD CONTROLLER PRINTER	
DWGS.or P.L.s	SUBSYSTEM KIT	DWGS.or P.L.s	SUBSYSTEM KIT
78X101671 (col.G2) 78B101672 78B101676	0643218 Y	78X101671 (col.G1) 78B101673 78B101676	0643217 B

2nd SITE PRINTER

DIRECT CONNECTION TO THE CPU (MPA)		CONNECTION TO CPU THROUGH THE MPS	
DWGS.or P.L.s	SUBSYSTEM KIT	DWGS.or P.L.s	SUBSYSTEM KIT
78X102196 (col.G1) 78B102197 78B102204	0643309 H	78X102196 (col.G2) 78B102198 78B102205	0643310 T

9.2.3. - Removal of Mechanical Parts

Mechanically disconnect Wing B from Wing A and Wing A from Wing C, referring to the following P.L.s :

P.L.	PARTS KIT FOR WING A TO WING B CONNECTION	PARTS KIT FOR WING A TO WING C CONNECTION	PART KITS FOR SELF STANDING SUBSYSTEM
78X101648 78X101644	0643203 M (col.G1)	0643204 A (col.G2)	0643205 E (col.G3) 1st PRT 0643306 L (col. G4) 2nd PRT - 50 Hz 0643307 Q (col. G5) 2nd PRT - 60 Hz

- All the witheld material must be grouped and set aside so as to recompose kits as per P.L. 78X101648.
- Once recomposed, mark these kits with their appropriate part numbers.
- Clean all the ALI 310 and VAR 332 fan filters.
- Replace all the physical units panels and covers, removed previously, and secure them with adhesive tape strips.
- Group the central upright cable duct's covers and secure them with strips of tape.

- In the event of "self standing" subsystems (site without double floor), also disassemble the Wing A to Wing C connecting cable ducts.
- Replace the print drum's lock bar in its transit shipment position and refit the two top casting to main structure transit posts. See fig. 4.1. items ③ and ①.

9.3. - SUBSYSTEM REMOVAL

The subsystem must be complete of :

- cable kits
- part kits
- subsystem documentation (schematics, diagnostics, descriptions, updated FCO Status Log, etc.)
- all not yet implemented FCOs
- product composition sheets
- special subsystem tools (P.L. 76X112176).

10. ATTACHED DRAWINGS

To complete the present Installation Manual, the following drawings and part lists have been attached.

DESCRIPTION	DWG.or P.L.	SHEET
2nd Paper Movement - Cable Connection Instr.	78A101602	
Installation of Subsystem Parts	78B101644	1/2 - 2F
Subsystem Part Kits	78X101648	1/2 - 2F
Physical Unit Kits	78X101667	1/2 - 2F
Subsystem Cable Markings and Connections	78B101668	
Physical Unit Cable Markings and Connections	78B101670	
Subsystem Kits	78X101671	
Subsystem Cable Markings and Connections	78B101672	
Subsystem Cable Markings and Connections	78B101673	
Installation of Subsystem Cables and Parts	78B101676	
Installation of Physical Unit Cables and Parts	78B101677	
Installation of Subsystem Cables and Parts	78B101682	
2nd Printer Subsystem Kits	78X102196	1/2 - 2F
Subsystem Cable Markings and Connections-2nd PRT	78B102197	
Subsystem Cable Markings and Connections - to MPS	78B102198	
Installation of 2nd Printer Subsystem Cables	78B102204	
Installation of Subsystem to MPS Conn. Cables	78B102205	
Spares List - Wing A and Wing B	15024682	
Spares List - I51-C (Kit D1)	429183	
I51-C Parts Kit (Pieces Accomp)	76X112175	
I51-C Special Tools-Accessories (List Forniture)	76X112176	
Integrated Controller Subsystem to GE 115/1 Tie-up Cable Markings and Connections	4.072.0.521	
Standard Controller Subsystem to GE 115/1 Tie-up Cable Markings and Connections	4.072.0.523	
Cable Cabinet for 90° Printer Layout	76B111630	

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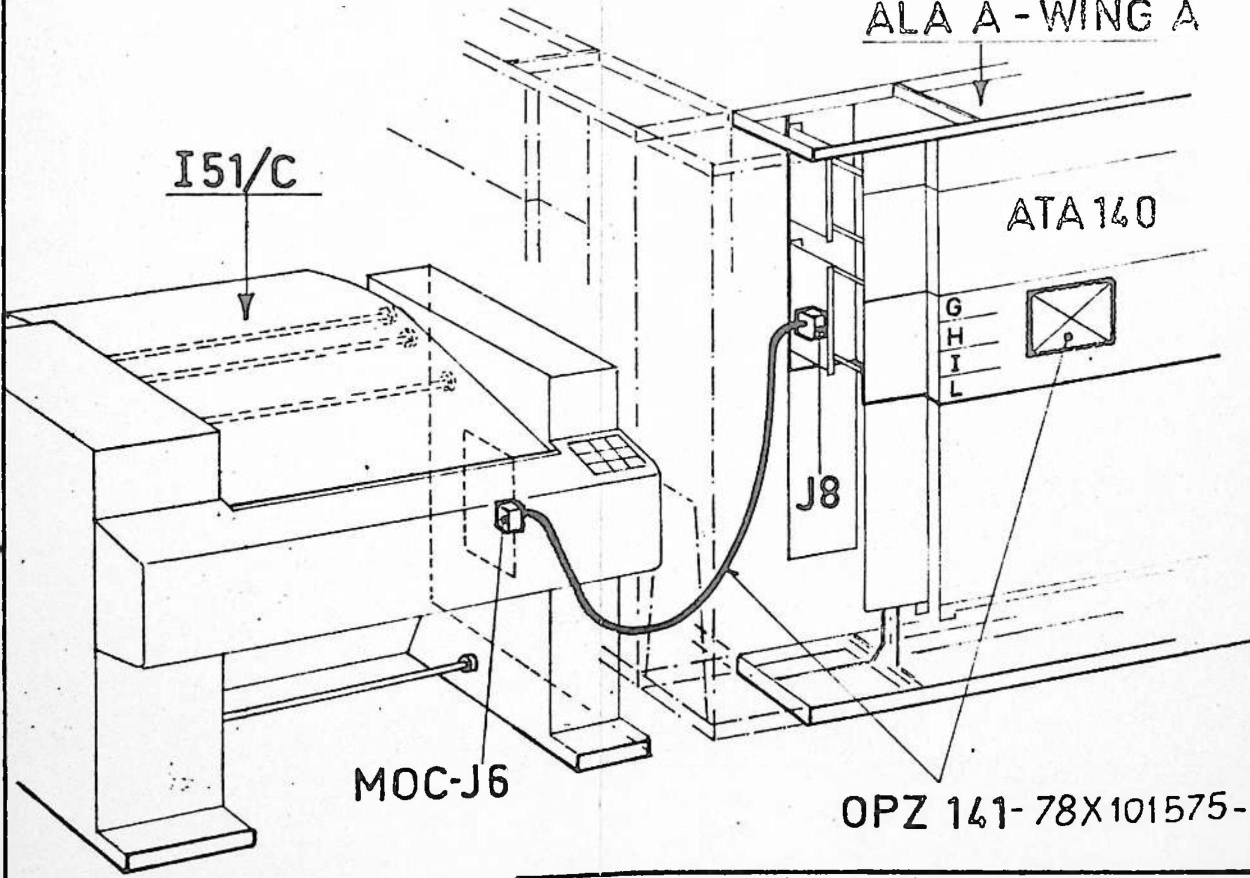

△ 1 - PER LE ISTRUZIONI DI MARCATURA VEDERE DIS. N° 09874010.

SEE LABELLING INSTRUCTION DRAWING. 09874 010

△1 MARCATURA E COLLEGAMENTO CAVI
CABLE CONNECTION AND MARKING

CAVO CABLE	DA FROM	A TO
78A 100588 G1 COD. 0640 194 U	ALA A - ATA 140 - J8	I51/C - MOC - J6

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78B101644

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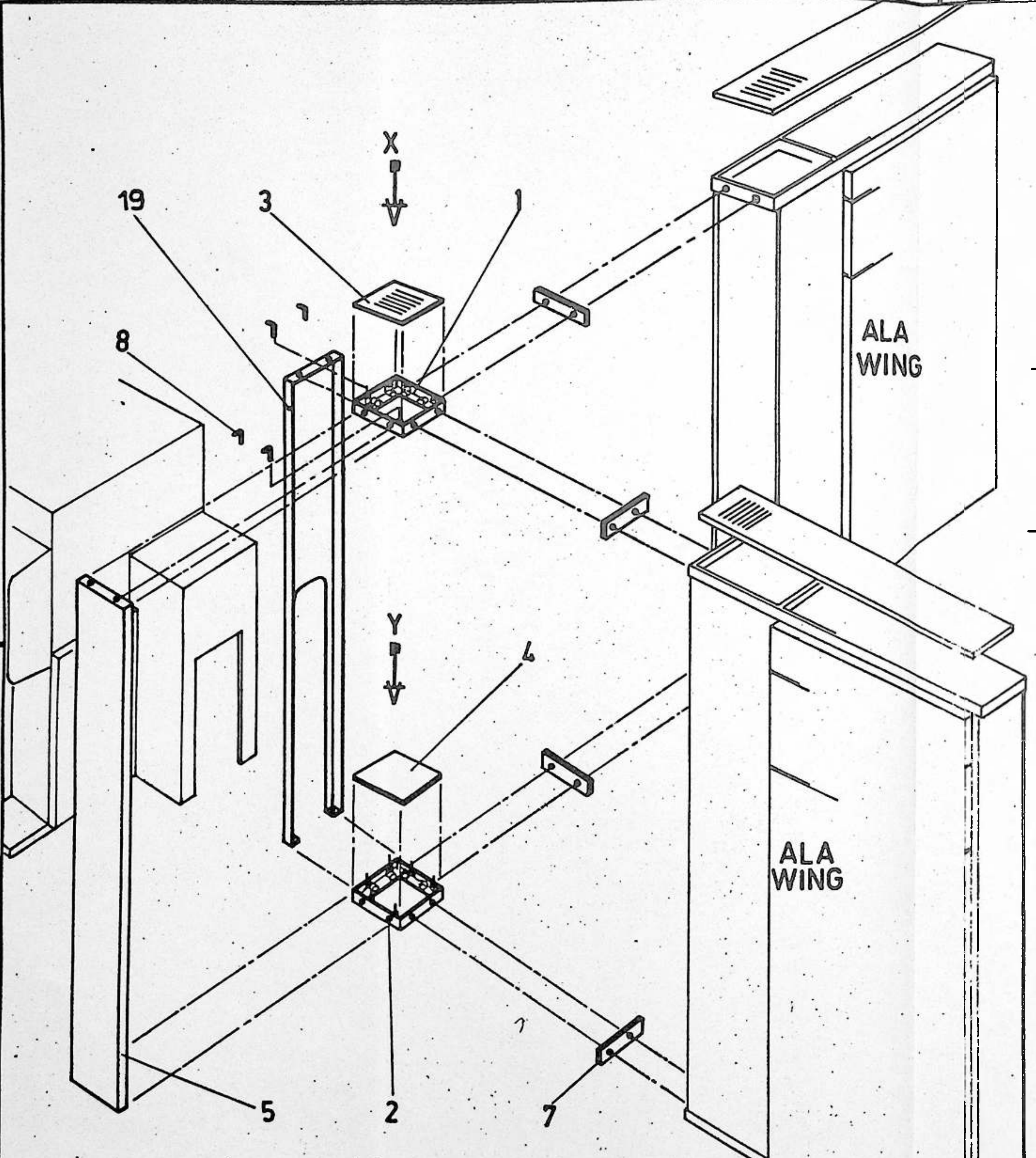

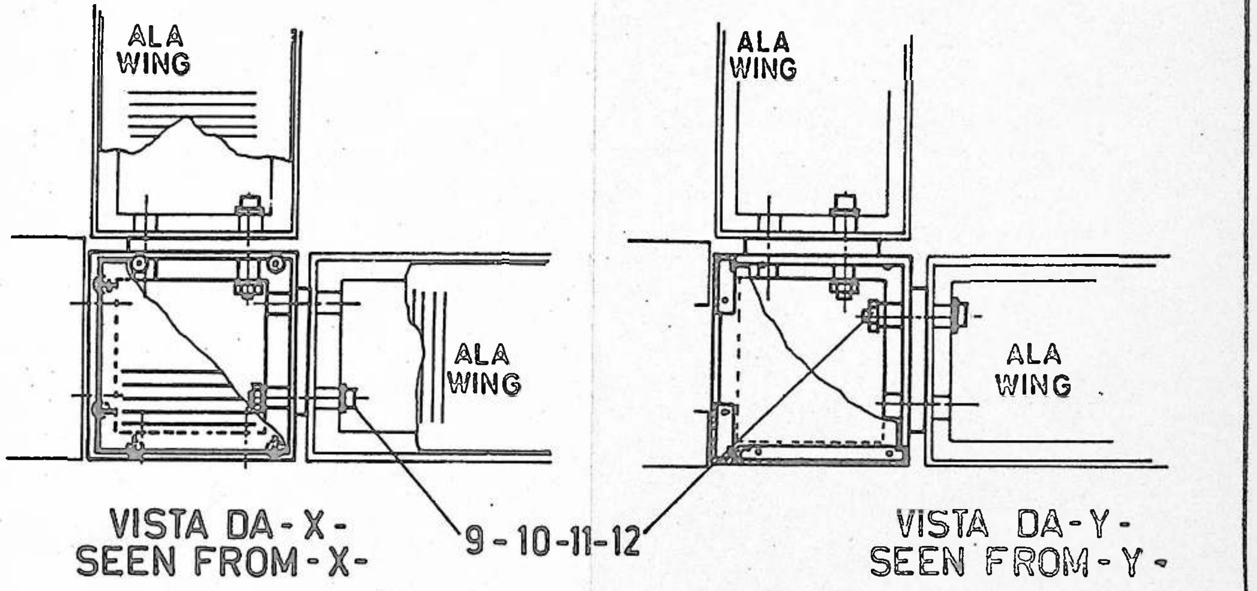

VISTA DA-X-
SEEN FROM-X-

VISTA DA-Y-
SEEN FROM-Y-

△3-ITEM NUMBERS SHOWN APPLY TO LIST 78X101648-G3.

△2-ITEM NUMBERS SHOWN APPLY TO MOD. KIT 78X101648-G2.

△1-ITEM NUMBERS SHOWN APPLY TO MOD. KIT. 78X 101648-G1

NOTES

△3-PARTI NUMERATE SECONDO LISTA N° 78X101648-G3

△2-PARTI NUMERATE SECONDO LISTA N° 78X101648-G2.

△1-PARTI NUMERATE SECONDO LISTA N° 78X101648-G1.

NOTE

FOR DOCUMENT STATUS SEE REVISION STATUS SHEET.

PER IL LIVELLO DI MODIFICA VEDI FOGLIO REVISIONE.

S.T.	
G 3	0643205 E ₀
G 2	0643206 A ₀
G 1	0643203 M ₀
GRUPPO	CODICE

Cod. 3896104 Q

△1

SALVO INDICAZIONE CONTRARIA

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TOLLERANZE DIMENS. E DI FORMA VEDI:

PROIEZIONE

SCALA —

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APPROVATO

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INSTALLAZ. PARTI

DISEGNO
78B101644

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REV B

78 B 101644

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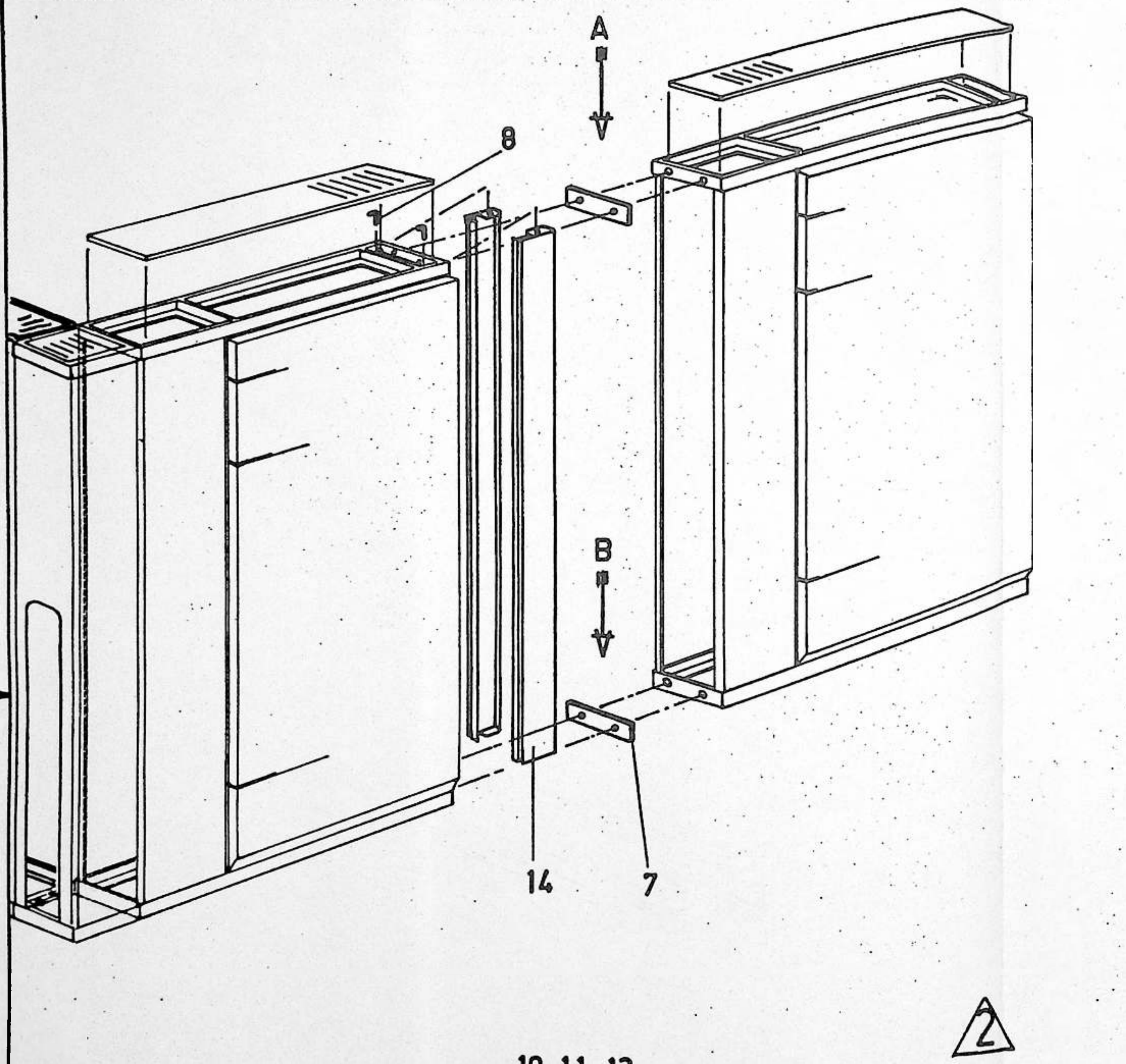
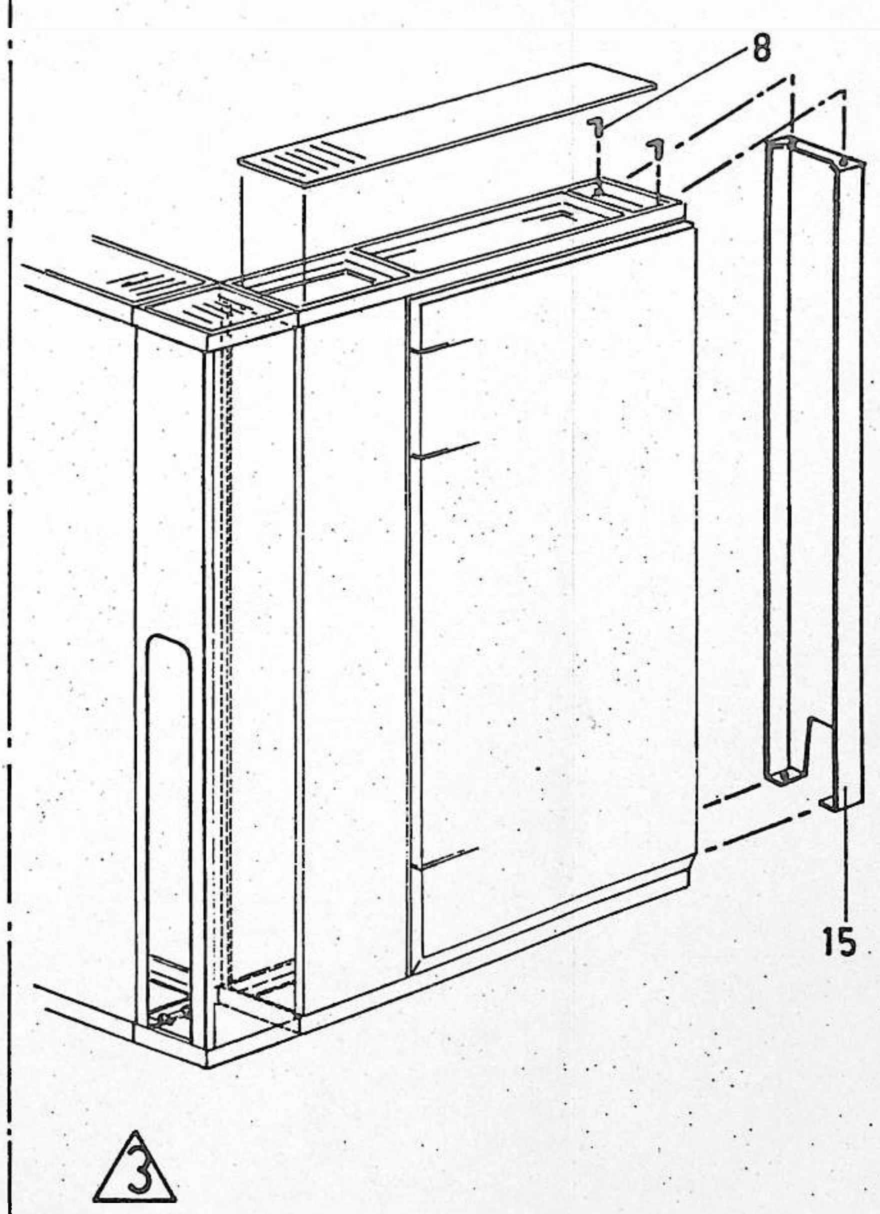
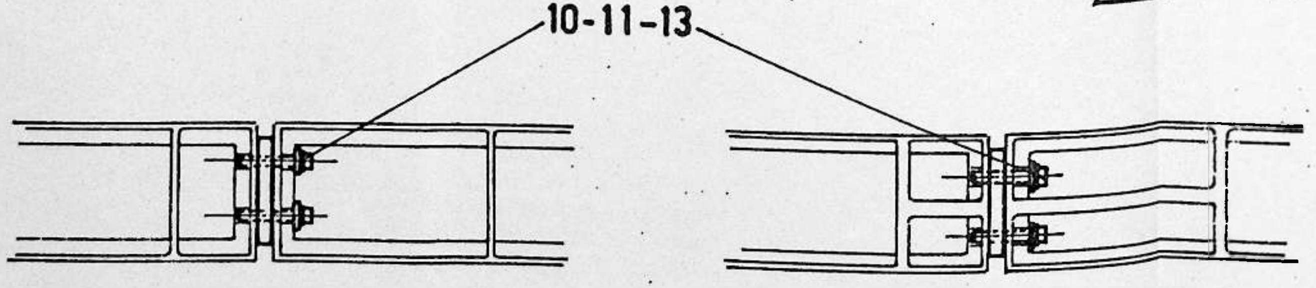
		A	M	G	







VISTA DA -A-
SEEN FROM -A-

VISTA DA -B-
SEEN FROM -B-

S.T.

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68 10 30

G1	0643203 N	G5	0643307 Q
G2	064320[illegible]	G6	
G3	0643205 E	G7	
G4	0643306 L	G8	

PL 78 X 101648 PAG. 1/2

*	POS. NO.	CD	NUMERO DI IDENTIFICAZIONE	DESCRIZIONE DELLA PARTE		G1	G2	G3	G4	G5	G6	G7	G8	UM
						GRUPPI E QUANTITA'								
	1	0	080 43 817	GIUNZIONE SUP.	0817083 R	1								EA
	2	0	085 44 261	GIUNZIONE PIEDE	0674268 M	1								EA
	3	0	080 44 831	COPERCHIO GRIGL.	0817073 G	1								EA
	4	0	080 43 835	FONDELLO	0835835 F	1								EA
	5	0	080 42 930	PANNELLO	0817113 T	1								EA
*	~~6~~	~~0~~	~~080 42 875~~	~~PANNELLO~~	[illegible]	~~1~~								EA
	7	0	080 44 812	DISTANZIALE	0835812 Q	4	2							EA
	8	0	080 44 859	PERNO	0835863 R	4	2	2	2	2				EA
	9	1	6313210 W	VITE T.C. C.E. M10x60	6313210 W	8								EA
	10	1	6331110 N	ROND. PIANA D. 10,5	6331110 N	16	4							EA
	11	1	6332110 S	ROND. ELAST. D. 10,5	6332110 S	8	4							EA
	12	1	6321110 M	DADO ESAG. M10	6321110 M	8								EA
	13	1	6313208 G	VITE T.C.C.E. M10x50	6313208 G		4							EA
	14	0	08042 860	REGOLI CANALETTA	0817046 A		2							EA
	15	0	080 42 864	CANALETTA PIEDE	0817081 H			1	1	1				EA
	16	0	78B101644	INSTALLAZ. PARTI		X	X	X	X	X				

CD - CODICE DI DISEGNO
0 - DISEGNO ISG
1 - PARTE ACQUISTATA A CATALOGO
2 - RICHIAMO DI PIU' ALTERNATIVE
3 - PARTE A CATALOGO DA MODIFICARE
4 - PARTE ISG DA MODIFICARE
5 - PARTE DA SELEZIONARE

UM - UNITA' DI MISURA
EA - NUMERO
CM - CENTIMETRO
IN - INCH
G - GRAMMO
* ULTIME POSIZIONI MODIFICATE

DESCRIZIONE
KIT PARTI
PL 78X101648 PAG. 1/2 REV. D

S.T.

Cod. 3896111 G
PER LE MODIFICHE VEDI FOGLIO REVISIONE
68.10.30

PL 78 X 101648 PAG. 2/F REV.

*	POS. NO	CD	NUMERO DI IDENTIFICAZIONE	DESCRIZIONE DELLA PARTE		G1	G2	G3	G4	G5	G6	G7	G8	UM
						GRUPPI E QUANTITA'								
	17	1	0002114 E	BREAKER TQL 32010	0002114 E				1					EA
	18	1	5351100 F	BREAKER TQC 32010	5351100 F					1				EA
*	19	0	78B103222	GR. MNT. PANNELLO	0676352 C	1								

CD - CODICE DI DISEGNO
0 - DISEGNO ISG
1 - PARTE ACQUISTATA A CATALOGO
2 - RICHIAMO DI PIU' ALTERNATIVE
3 - PARTE A CATALOGO DA MODIFICARE
4 - PARTE ISG DA MODIFICARE
5 - PARTE DA SELEZIONARE

UM - UNITA' DI MISURA
EA - NUMERO
CM - CENTIMETRO
IN - INCH
G - GRAMMO
* ULTIME POSIZIONI MODIFICATE

DESCRIZIONE
KIT PARTI
PL 78 X 101648 PAG. 2/F REV. D

S.T.

Cod. 3898111 G
PER LE MODIFICHE VEDI FOGLIO REVISIONE
68.10.30

G1	0643 212 E o	G5	0643308 D o
G2	0643 21[illegible] A o	G6	
G3	0643 214 X o	G7	
G4	0643 215 T o	G8	

PL 78X101667 PAG. 1/2 REV. B

*	POS. NO	CD	NUMERO DI IDENTIFICAZIONE	DESCRIZIONE DELLA PARTE		G1	G2	G3	G4	G5	G6	G7	G8	UM
						GRUPPI E QUANTITA'								
	1	0	00514 162	CAVO NS 124	0640126V	1	1							EA
	2	0	78 A 100 588	CAVO NS 152	0640194U	3	3							EA
	3	0	78 A 101702 G1	CAVO NORM. ST1	0800864M	1								EA
	4	0	78 A 101702 G2	CAVO NORM. ST2	0800865P	1								EA
	5	0	78 A 101703 G1	CAVO CMC7 ST1	0800866V		1							EA
	6	0	78 A 101703 G2	CAVO CMC7 ST2	0800867Z		1							EA
	7	0	78 B 101668	MARCAT. E COLLEG.		X	X							
	8	0	78 B 101682	INSTALL. CAVI E PARTI		X	X							
	9	1	6314102 H	VITE T.E. M6X10	6314102H	4	4							EA
	10	1	6332106K	ROND. EL. ф 6,4	6332106K	4	4							EA
X	11	0	00514 108	CAVO NS 108	0640048X			1	1	1				EA
	12	0	00514. 162	CAVO NS 124	0640124M			1	1	1				EA
	13	0	00524 148	CAVO AL 148	0640667F			1	1	1				EA
X	14	0	00524 153	CAVO AL 100	0640398Z			2	2	2				EA
X	15	0	00524 153	CAVO AL 101	0640350N			2	2	2				EA
X	16	0	78A 101538-G2	CAVO LAMP	0800879K			1	1	1				EA

CD - CODICE DI DISEGNO
0 - DISEGNO ISG
1 - PARTE ACQUISTATA A CATALOGO
2 - RICHIAMO DI PIU' ALTERNATIVE
3 - PARTE A CATALOGO DA MODIFICARE
4 - PARTE ISG DA MODIFICARE
5 - PARTE DA SELEZIONARE

UM - UNITA' DI MISURA
EA - NUMERO
IN - INCH
G - GRAMMO
CM - CENTIMETRO

* ULTIME POSIZIONI MODIFICATE

DESCRIZIONE KIT DI U.F.

PL 78X101667 PAG. 1/2 REV. C

S.T.

Cod. 3898111 G

PER LE MODIFICHE VEDI FOGLIO REVISIONE

68.10.30

PL 78X101667 PAG. 2F REV. B

*	POS. NO	CD	NUMERO DI IDENTIFICAZIONE	DESCRIZIONE DELLA PARTE		G1	G2	G3	G4	G5	G6	G7	G8	UM
						GRUPPI E QUANTITA'								
X	17	0	78A103044-G2	CAVO LAMP	0800878P			1	1	1				EA
	18	0	00524 146	CAVO AL 146	0640647D			2						EA
	19	0	00524 145	CAVO AL 145	0640643C				2					EA
	20	0	78 B 101670	MARCAT. E COLL.				X	X	X				
	21	0	78B101677	INSTALLAZ. CAVI				X	X	X				
	22	1	5613640 B	CINTURINO CFB	5613640B			7	7	7				EA
	23	1	5613652 R	CAPSULA CN	5613652R			7	7	7				EA
	24	0	00524 153	CAVO - AL 101	0640353X			1	1	1				EA
X	25	0	78A 101764	CAVO - AL 214	0640994U			1	1	1				EA

CD - CODICE DI DISEGNO
0 - DISEGNO ISG
1 - PARTE ACQUISTATA A CATALOGO
2 - RICHIAMO DI PIU' ALTERNATIVE
3 - PARTE A CATALOGO DA MODIFICARE
4 - PARTE ISG DA MODIFICARE
5 - PARTE DA SELEZIONARE

UM - UNITA' DI MISURA
EA - NUMERO
IN - INCH
G - GRAMMO
CM - CENTIMETRO

* ULTIME POSIZIONI MODIFICATE

DESCRIZIONE KIT DI U.F.

PL 78X101667 PAG. 2F REV. C

S.T.

Cod. 3898111 G

PER LE MODIFICHE VEDI FOGLIO REVISIONE

68.10.30

78B101668

△1	RIF. REF. △2	TIPO TYPE	△11 G1	G2	MARCATURA CAVI / CABLE LABELLING LATO INT. ALL' U. F. SIDE INT. TO PH. UNIT △3	LATO EST. ALL'U.F. SIDE EXT. TO PH. UNIT △3	FUNZ. FUNCT.	NOTE NOTES
X	C1	NS124	1	1	ALA A -ATA140- J9	I51/C-TAV- J1	SEGN.	
X	C2	NS152	2	2	ALA A - ATA140- J6	I51/C - MOC - J4	SEGN.	
X	C3	NS152	2	2	ALA A-ATA140- J5	I51/C- MOC-J5		
X	C4	NS152	2	2	ALA A-ATA140- J7	I51/C- MOC-J3		
X	C5		3	5	LA A- ATA 140 - J1 J2	I51/C - MOC - ST.1		
X	C6		4	6	LA A - ATA 140- J3 J4	I51/C - MOC - ST.2		

Mod. 1003/1

S.T.

REVISIONI

REV	ORD. APPL.	DATA A	DATA M	DATA G	FIRMA
A	DEF. 695067/0	69	10	28	
B	CO Nl 00445	70	10	06	

NOTES	NOTE
△11 - ITEM NUMBERS SHOWN APPLY TO LIST 78X101667.	△11 - PARTI NUMERATE SECONDO LISTA N° 78X101667 G1-G2
△10 - WHITE	△10 - BIANCO
△9 - GREEN	△9 - VERDE
△8 - BROWN	△8 - MARRONE
△7 - BLUE	△7 - BLU
△6 - RED	△6 - ROSSO
△5 - BLACK	△5 - NERO
△4 - YELLOW	△4 - GIALLO
△3 - SEE LABELLING INSTRUCTION DRAWING No. 09874010	△3 - VEDERE ISTR. MARCATURA DIS. N° 09874010.
△2 - FOR THE CABLES ASSEMBLY SIDE REF. TO DRAW No.	△2 - PER IL MONT. CAVI LATO VEDI DIS. N°
△1 - X - PARTS ASSEMBLED WHEN DELIVERED.	△1 - X - PARTI MONTATE ALLA SPEDIZIONE.

SALVO INDICAZIONE CONTRARIA DIMENSIONI: MILLIMETRI / INCH TOLLERANZE DIMENS. E DI FORMA VEDI: PROIEZIONE	MAT. TT. FIN.	DESCRIZIONE MARCAT. E COLL. CAVI
SCALA	COD.	DISEGNATO UGGERI 69 AGO 5 APPROVATO DISTR.
		DISEGNO 78B101668
		PAG 1/1
		REV B
		CODICE

78B101670

△1	RIF. REF.	TIPO TYPE	△2 G3	G4	G5	MARCATURA E COLLEGAMENTO CAVI CABLE CONNECTION AND MARKING △3 LATO INT. ALL' U.F. SIDE INT. TO PH. UNIT	LATO EST. ALL' U.F. SIDE EST. TO PH.UNIT	FUNZ. FUNCT.	NOTE NOTES
X	C1	NS108	11	11	11	ALA B – ALI 310 J4	I 51/C MOC J2	SEGN.	
X	C2	NS124	12	12	12	ALA B – ALI 310 J5	ALA A ATA 140 J10	SEGN.	
X	C3	AL148	13	13	13	ALA B – ALI 310 P1–9	I 51/C MOC P1–1	AC	5
						10	2	AC	6
						11	3	AC	7
						12	4	AC	9
						12	4	AC	8
X	C4	AL100	14	14	14	ALA B – ALI 310 P4–2	I 51/C MOC P2–1	D.C.	4
X	C5	AL101	15	15	15	ALA B – ALI 310 P4–1	I 51/C MOC P2–2	D.C.	5
X	C6	AL100	14	14	14	ALA B – ALI 310 P4–3	ALA A ATA140–BAR 60	D.C.	4
X	C7	AL101	15	15	15	ALA B – ALI 310 P4–4	ALA A ATA140–BAR ⏚	D.C.	5
X	C8	LAMP	16	16	16	ALA B – ALI 310 P3–1/2	I 51/C MOC P3–1	D.C.	5
							3		
							5		
X	C9	LAMP	17	17	17	ALA B – ALI 310 P3–3/4	I 51/C MOC P3–2	D.C.	4
							4		
							6		
X	C10	/	18	19	△11	ALA B – ALI 260–1 J1	INPUT RETE	A.C.	
X	C11	/	18	19	△11	ALA B – ALI 260–2 J1	INPUT RETE	A.C.	
X	C12	AL101	24	24	24	ALA B – ALI 310 P8–9	ALA A – P2 ⏚ . .	D.C.	5
X	C13	AL214	25	25	25	ALA B – ALI 310 P8–8	I 51/C MOC ⏚ . .	D.C.	5

REVISIONI

REV	ORD. APPL.	DATA A	M	G	FIRMA
A	DEF. 695072/o	69	11	17	gDoni
B	C.O. M1 00001	70	01	29	gDoni
C	CO. MI 00445	70	10	06	
C1	CO M1 00578	70	11	18	gBoni

FOR THE CABLES ASSEMBLY SIDE REF. TO DRAW No.

PER IL MONTAGGIO CAVI VEDI DIS.

△11 NOT USED

10 – WHITE
9 – GREEN
8 – BROWN
7 – BLUE
6 – RED
5 – BLACK
4 – YELLOW

△3 – SEE LABELLING INSTRUCTION DRAWING No 09874 010

△2 – ITEM NUMBERS SHOWN APPLY TO DRAWING No 78X101667 Pos. No

△1-X – PARTS ASSEMBLED WHEN DELIVERED

NOTES

△11 NON USATI

10 – BIANCO
9 – VERDE
8 – MARRONE
7 – BLU
6 – ROSSO
5 – NERO
4 – GIALLO

△3 – VEDERE ISTRUZ. MARCATURA DIS. No 09874 010

△2 – PARTI NUMERATE SECONDO LISTA DIS 78X101667 Pos N°

△1-X – PARTI MONTATE ALLA SPEDIZIONE

NOTE

SALVO INDICAZIONE CONTRARIA
DIMENSIONI: MILLIMETRI / INCH
TOLLERANZE DIMENS. E DI FORMA VEDI:
PROIEZIONE

SCALA /
COD.

MAT. /
TT. /
FIN. /
DISEGNATO 69-AGO-5 UGGERI
APPROVATO
DISTR.

DESCRIZIONE
MARC. E COLL.CAVI

DISEGNO 78B101670
PAG 1/1
REV C1

ALA-B

S.T

Cod.

69 10 30

G1	0643217 B.	G5	
G2	0643218 Y.	G6	
G3		G7	
G4		G8	

PL 78X101671	PAG. 1/1	REV. B

✱	POS. NO	CD	NUMERO DI IDENTIFICAZIONE	DESCRIZIONE DELLA PARTE		GRUPPI E QUANTITA'								UM
						G1	G2	G3	G4	G5	G6	G7	G8	
✱	~~1~~	~~0~~	~~00514 077~~	~~CAVO NS45~~	~~0641228R~~		~~3~~							EA
	2	0	00524 153	CAVO AL 100	0640395L	1	1							EA
	3	0	00524 153	CAVO AL 101	0640349Q	1	1							EA
	4	0	00524 147	CAVO AL 147	0640654S	1	1							EA
	5	0	00524 141	CAVO AL 141	0640621S	1	1							EA
	6	0	00524 141	CAVO AL 141	0640547B	1	1							EA
	7	0	78B101672	MARCAT. E COLLEG			X							
	8	0	78B101673	MARCAT. E COLLEG		X								
	9	0	78B101676	INSTALLAZ. CAVI		X	X							
	10	0	00514 077	CAVO NS 45	0641230K	3								EA
	11	0	01543 327	PST. TAPO B	0615231J	1								EA
	12	0	01543 218	PST. TACA A	0618026G	1								EA
✱	1	0	00514 077	CAVO NS 45	0641229M		3							EA

S.T.

CD - CODICE DI DISEGNO

0 - DISEGNO ISG
1 - PARTE ACQUISTATA A CATALOGO
2 - RICHIAMO DI PIU' ALTERNATIVE
3 - PARTE A CATALOGO DA MODIFICARE
4 - PARTE ISG DA MODIFICARE
5 - PARTE DA SELEZIONARE

UM - UNITA' DI MISURA

~~#~~ EA - NUMERO
CM - CENTIMETRO
IN - INCH
G - GRAMMO

✱ ULTIME POSIZIONI MODIFICATE

DESCRIZIONE
KIT DI SST.

PL 78X101671	PAG. 1/1	REV. B

Cod. 3898111 G

PER LE MODIFICHE VEDI FOGLIO REVISIONE

03.10.30

78 B101672

REVISIONI					
REV	ORD. APPL.	DATA A	DATA M	DATA G	FIRMA
A	DEF. 695076/0	69	12	10	gDai
B	Co. M100445	70	10	06	

△1	RIF. REF. △2	TIPO TYPE	△11	MARCATURA CAVI CABLE LABELLING LATO INT. ALL' U. F. SIDE INT. TO PH. UNIT △3	MARCATURA CAVI CABLE LABELLING LATO EST. ALL'U.F. SIDE EXT. TO PH. UNIT △3	FUNZ. FUNCT.	NOTE NOTES
X	C1	NS45	1	ALA A-GOC100- D01	L-PRT - A	LOG.	
X	C2	NS45	1	ALA A - GOC100- D02	L - PRT - B	LOG.	
X	C3	NS45	1	ALA A - GOC100 - D03	L - PRT - D	LOG.	
X	C4	AL100	2	ALA A - P1	U-PRT- +20	D.C.	4
X	C5	AL101	3	ALA A - P2	U - PRT - MASSA	D.C.	5
X	C6	AL 147	4	ALA A - P20-1	ALA C - P20-1	A.C.	6
				2	2		7
				3	3		5
				4	4		8
				5	5		9
X	C7	AL141	5	ALA A - P20-7	ALA C - P20 - 7	CONTR.	8
				8	8		4
				9	9		5
X	C8	AL141	6	ALA B - ALI260-1-P5-5	ALAF-TAV 420/460 P1-	CONTR.	4
				4	6		5
				1	10		8

NOTES	NOTE
△11- ITEM NUMBERS SHOWN APPLY TO LIST 78X101671 G2	△11- PARTI NUMERATE SECONDO LISTA Nº 78X101671G2
△10- WHITE	△10- BIANCO
△9 - GREEN	△9 - VERDE
△8 - BROWN	△8 - MARRONE
△7 - BLUE	△7 - BLU
△6 - RED	△6 - ROSSO
△5 - BLACK	△5 - NERO
△4 - YELLOW	△4 - GIALLO
△3- SEE LABELLING INSTRUCTION DRAWING No.09874010	△3- VEDERE ISTR. MARCATURA DIS.Nº 09874010.
△2- FOR THE CABLES ASSEMBLY SIDE REF. TO DRAW No	△2- PER IL MONT. CAVI LATO VEDI DIS.Nº
△1-X- PARTS ASSEMBLED WHEN DELIVERED.	△1-X- PARTI MONTATE ALLA SPEDIZIONE.

SALVO INDICAZIONE CONTRARIA

DIMENSIONI: MILLIMETRI / INCH

TOLLERANZE DIMENS. E DI FORMA VEDI:

PROIEZIONE

SCALA

COD.

MAT.

TT.

FIN.

DISEGNATO UGGERI 69 AGO 5

APPROVATO

DISTR.

DESCRIZIONE: MARCAT. E COLLEG.CAVI

INTEGR.

DISEGNO: 78B101672

PAG: 1/1

REV: B

CODICE

S.T.

INTEGR.

mod. 1003/1

78B101673

REVISIONI					
REV	ORD. APPL.	DATA A	DATA M	DATA G	FIRMA
A	DEF. 695076/0	69	12	10	G. Dori
B	CO M1 00445	70	10	06	

△1	RIF. REF. △2	TIPO TYPE	△11	MARCATURA CAVI CABLE LABELLING LATO INT. ALL' U. F. SIDE INT. TO PH. UNIT △3	MARCATURA CAVI CABLE LABELLING LATO EST. ALL'U.F. SIDE EXT. TO PH. UNIT △3	FUNZ. FUNCT.	NOTE NOTES
╳	C1	NS45	10	ALA A – GOC200– E01	L – PRT – A	LOG.	
╳	C2	NS45	10	ALA A – GOC200 – E02	L – PRT – C	LOG.	
╳	C3	NS45	10	ALA A – GOC200– E03	L – PRT – D	LOG.	
╳	C4	AL100	2	ALA A P1	U – PRT – +20	D.C.	4
╳	C5	AL101	3	ALA A P2	U – PRT – MASSA	D.C.	5
╳	C6	AL147	4	ALA A – P20–1	ALA C – P20–1	A.C.	6
				2	2		7
				3	3		5
				4	4		8
				5	5		9
╳	C7	AL141	5	ALA A– P20–7	ALA C – P20–7	CONTR.	8
				8	8		4
				9	9		5
╳	C8	AL141	6	ALA B– ALI260–1 P5–5	ALA F–TAV420/460 P1–7	CONTR.	4
				4	6		5
				1	10		8

△11- ITEM NUMBERS SHOWN APPLY TO LIST 78X101671 G1	△11- PARTI NUMERATE SECONDO LISTA N° 78X101671 G1
△10- WHITE	△10- BIANCO
△9- GREEN	△9- VERDE
△8- BROWN	△8- MARRONE
△7- BLUE	△7- BLU
△6- RED	△6- ROSSO
△5- BLACK	△5- NERO
△4- YELLOW	△4- GIALLO
△3- SEE LABELLING INSTRUCTION DRAWING No. 09874010	△3- VEDERE ISTR. MARCATURA DIS. N° 09874010.
△2- FOR THE CABLES ASSEMBLY SIDE REF. TO DRAW No	△2- PER IL MONT. CAVI LATO VEDI DIS. N°
△1-X- PARTS ASSEMBLED WHEN DELIVERED.	△1-X- PARTI MONTATE ALLA SPEDIZIONE.
NOTES	NOTE

SALVO INDICAZIONE CONTRARIA

DIMENSIONI: MILLIMETRI / INCH

TOLLERANZE DIMENS. E DI FORMA VEDI:

PROIEZIONE

SCALA

COD.

MAT.

TT.

FIN.

DISEGNATO UGGER 69 AGO 5

APPROVATO

DISTR.

DESCRIZIONE

STANDARD

MARCAT. E COLLEG. CAVI

DISEGNO 78B101673

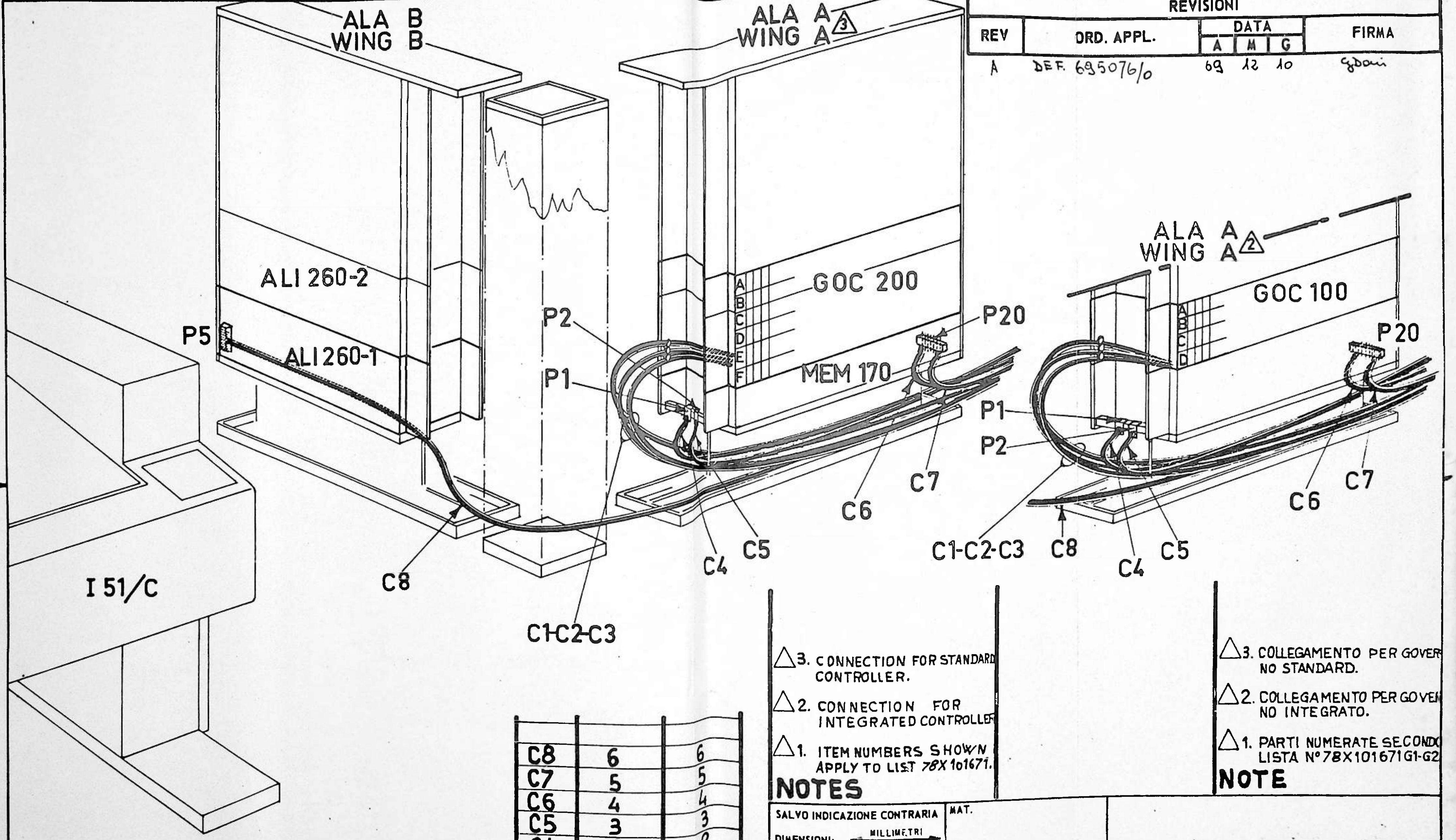
PAG 1/1

REV B

CODICE

S.T.

REVISIONI					
REV	ORD. APPL.	DATA A	DATA M	DATA G	FIRMA
A	DEF. 695076/0	69	12	10	



C8	6	6
C7	5	5
C6	4	4
C5	3	3
C4	2	2
C3	10	1
C2	10	1
C1	10	1
CAVO CABLE	△1 G 1 POS. N°	△1 G2 POS. N°

△3. CONNECTION FOR STANDARD CONTROLLER.

△2. CONNECTION FOR INTEGRATED CONTROLLER

△1. ITEM NUMBERS SHOWN APPLY TO LIST 78X 101671.

NOTES

△3. COLLEGAMENTO PER GOVER
NO STANDARD.

△2. COLLEGAMENTO PER GOVEN
NO INTEGRATO.

△1. PARTI NUMERATE SECOND
LISTA N° 78X101671 G1-G2

NOTE

SALVO INDICAZIONE CONTRARIA

DIMENSIONI: MILLIMETRI / INCH

TOLLERANZE DIMENS. E DI FORMA VEDI:

PROIEZIONE

SCALA

COD.

MAT.

TT.

FIN.

DISEGNATO Borello 69 AGO 11

APPROVATO

DISTR.

DESCRIZIONE

INSTALL. CAVI E PARTI

DISEGNO 78B101676

PAG 1/1

REV A

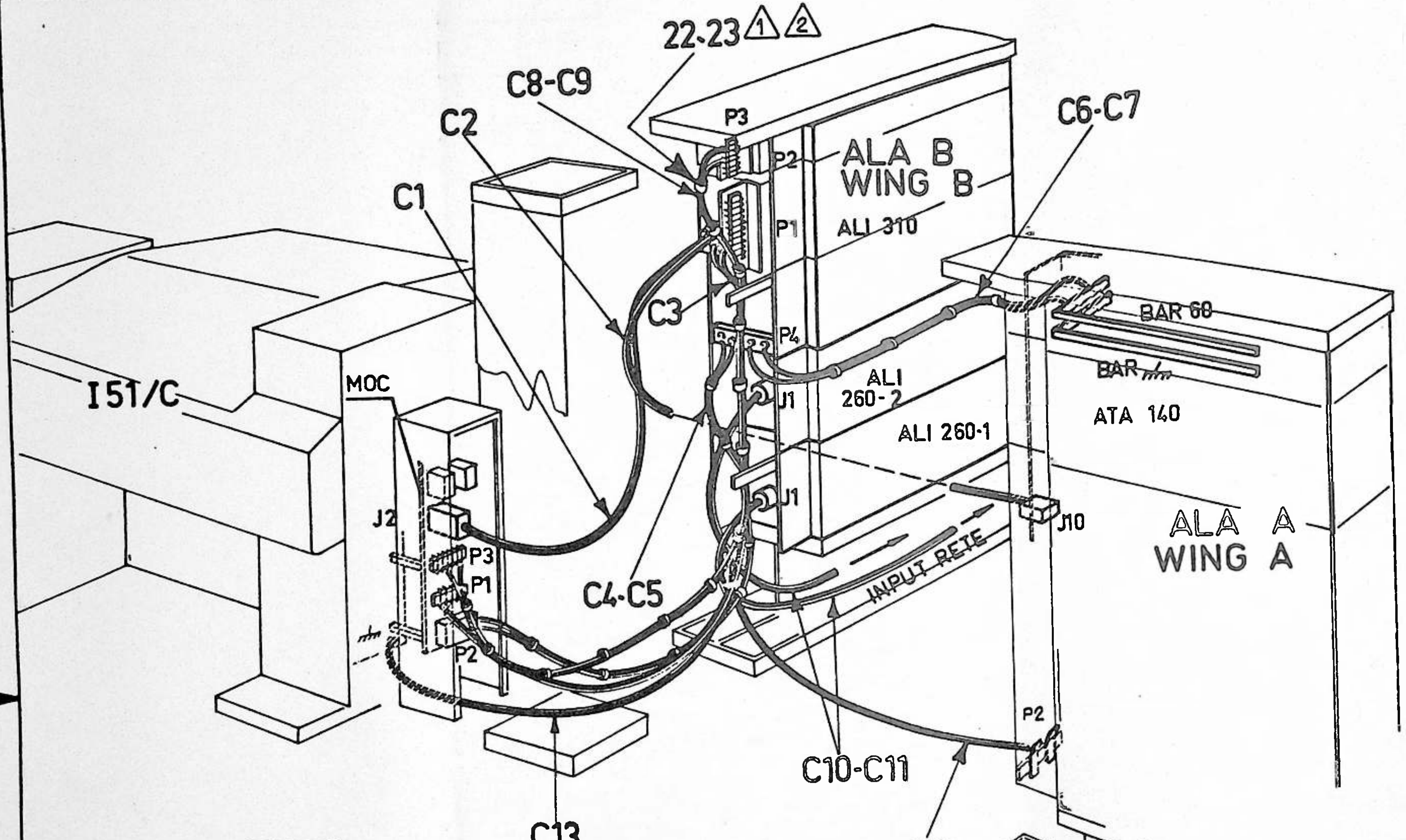
S.T.

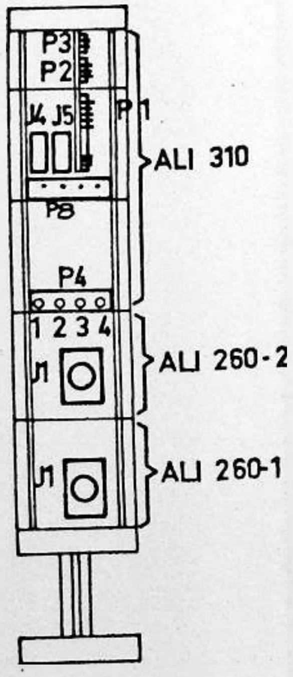
Cod. 3898104Q

68 10 30

78B101677

REVISIONI					
REV	ORD. APPL.	DATA			FIRMA
		A	M	G	
A	DEF. 695072/0	69	11	17	GDani
B	C.O. H1 00001	70	01	29	GDani





CAVO CABLE	G3 △1 POS. N°	G4 △1 POS. N°	G5 △1 POS. N°
C1	11	11	11
C2	12	12	12
C3	13	13	13
C4	14	14	14
C5	15	15	15
C6	14	14	14
C7	15	15	15
C8	16	16	16
C9	17	17	17
C10	18	19	NOT USED
C11	18	19	NOT USED
C12	24	24	24
C13	25	25	25

△2. THE COUPLES OF CABLES C4-C5/C6-C7/C8-C9/MUST BE TIED WITH MATERIAL GIVEN IN POS. No 22-23 FOR THEIR WHOLE PATH.

△1. ITEM NUMBERS SHOWN APPLY TO LIST 78X101667.

NOTES

△2. LE COPPIE DI CAVI C4-C5/C6-C7/C8-C9/ DEVONO ESSERE LEGATI CON MATER. A POS.N° 22-23 PER TUTTO IL LORO PERCORSO.

△1. PARTI NUMERATE SECONDO LISTA N° 78X101667

NOTE

SALVO INDICAZIONE CONTRARIA
DIMENSIONI: MILLIMETRI / INCH
TOLLERANZE DIMENS. E DI FORMA VEDI:
PROIEZIONE
SCALA
COD.

MAT.
TT.
FIN.
DISEGNATO 69 AGO 6 UGGERI
APPROVATO
DISTR.

DESCRIZIONE
INSTALL. CAVI E PARTI

DISEGNO 78B101677
PAG 1/1
REV B

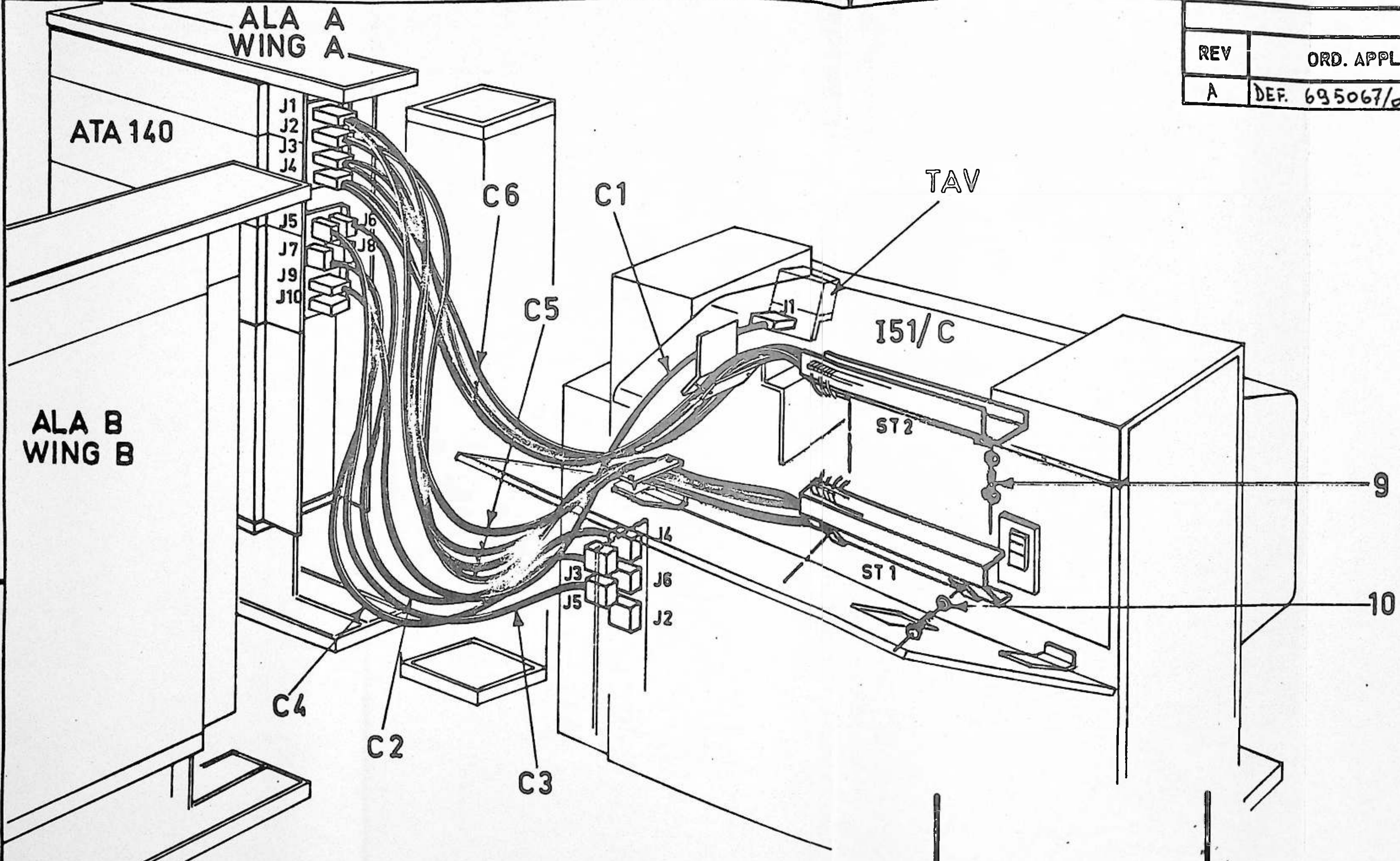
68 10 30

S.T.

Cod. 3696104 Q

78B101682

REVISIONI					
REV	ORD. APPL.	DATA			FIRMA
		A	M	G	
A	DEF. 695067/0	69	10	28	GDoni



CAVO CABLE	△ G1 POS. N°	△ G2 POS. N°
C6	4	6
C5	3	5
C4	2	2
C3	2	2
C2	2	2
C1	1	1

△ 1. ITEM NUMBERS SHOWN APPLY TO LIST 78X101667.

NOTES

△ 1. PARTI NUMERATE SECONDO LISTA N° 78X101667 G1 - G2.

NOTE

SALVO INDICAZIONE CONTRARIA

DIMENSIONI: MILLIMETRI / INCH

TOLLERANZE DIMENS. E DI FORMA VEDI:

PROIEZIONE

SCALA

COD.

MAT.

TT.

FIN.

DISEGNATO UGGERI 69A608

APPROVATO

DISTR.

DESCRIZIONE

INSTALL. CAVI E PARTI

DISEGNO 78B101682

PAG 1/1

REV A

S.T.

Cod. 3696104Q

CODICE			
G1	0643309 H	G5	
G2	06[illegible]310 T	G6	
G3		G7	
G4		G8	

PL 78X102196 PAG. 1/2 REV. A

*	POS. NO	CD	NUMERO DI IDENTIFICAZIONE	DESCRIZIONE DELLA PARTE		G1	G2	G3	G4	G5	G6	G7	G8	UM
	1	0	01543 327	PIASTR. TAPO B	0615231J	1								EA
	2	0	01543 218	PIASTR TACA A	0618026G	1								EA
	3	0	00514 077	CAVO NS 45	0641232Y	3								EA
	4	0	00524 153	CAVO AL 100	0640389J	1								EA
	5	0	00524 153	CAVO AL 101	0640388Y	1								EA
	6	0	00524 147	CAVO AL 147	0640748U	1								EA
	7	0	00524 141	CAVO AL 141	0640612U	1								EA
	8	0	00524 136	CAVO AL 136	0640593F	1								EA
	9	0	78B102197	MARCAT. E COLL.		X								
	10	0	78B102204	INSTALLAZ. CAVI		X								
	11	0	78B102198	MARCAT. E COLLEG			X							
	12	0	00514 167	CAVO NS129	0640150J		1							EA
	13	0	00524 153	CAVO AL 100	0640400F		2							EA
	14	0	00524 153	CAVO AL 101	0640405H		2							EA
	15	0	78A100591G1	CAVO AL 202	0640950K		1							EA
	16	0	78A100592G1	CAVO AL 204	0640962Z		1							EA

S.T. CONTR. OGGERI

CD - CODICE DI DISEGNO

0 - DISEGNO ISG
1 - PARTE ACQUISTATA A CATALOGO
2 - RICHIAMO DI PIU' ALTERNATIVE
3 - PARTE A CATALOGO DA MODIFICARE
4 - PARTE ISG DA MODIFICARE
5 - PARTE DA SELEZIONARE

EA UM - UNITA' DI MISURA
~~#~~ - NUMERO
IN - INCH
G - GRAMMO
CM - CENTIMETRO

✱ ULTIME POSIZIONI MODIFICATE

DESCRIZIONE
KIT CAVI DI SST

PL 78X102196 PAG. 1/2 REV. A

Cod. 3898111G

PER LE MODIFICHE VEDI FOGLIO REVISIONE

68 10.30

PL 78X102196 PAG. 2F REV. A

*	POS. NO.	CD	NUMERO DI IDENTIFICAZIONE	DESCRIZIONE DELLA PARTE		G1	G2	G3	G4	G5	G6	G7	G8	UM
	17	0	00524 136	CAVO A L 136	0640587P		1							EA
	18	0	78A100607G1	CAVO AL 205	0640965N		1							EA
	19	0	78B102205	INSTALL. CAVI			X							

S.T. CONTR. UGGER

CD - CODICE DI DISEGNO

0 - DISEGNO ISG
1 - PARTE ACQUISTATA A CATALOGO
2 - RICHIAMO DI PIU' ALTERNATIVE
3 - PARTE A CATALOGO DA MODIFICARE
4 - PARTE ISG DA MODIFICARE
5 - PARTE DA SELEZIONARE

EA UM - UNITA' DI MISURA
~~#~~ - NUMERO
IN - INCH
G - GRAMMO
CM - CENTIMETRO

✱ ULTIME POSIZIONI MODIFICATE

DESCRIZIONE
KIT CAVI DI SST

PL 78X102196 PAG. 2F REV. A

Cod. 3898111G

PER LE MODIFICHE VEDI FOGLIO REVISIONE

68 10.30

78B102197

△1	RIF. REF.	TIPO TYPE	△2		MARCATURA E COLLEGAMENTO CAVI CABLE CONNECTION AND MARKING △3		FUNZ. FUNCT.	NOTE NOTES
			G1		LATO INT. ALL' U.F. SIDE INT. TO PH. UNIT	LATO EST. ALL' U.F. SIDE EST. TO PH.UNIT		
X	C1	NS 45	3		ALA A GOC 200 E01	L - PRT 2 - A	Log.	
X	C2	NS 45	3		ALA A GOC 200 E02	L - PRT 2 - C	Log.	
X	C3	NS 45	3		ALA A GOC 200 E03	L - PRT 2 - D	Log.	
X	C4	AL100	4		ALA A P1	U - PRT 2 - +20	D.C.	4
X	C5	AL101	5		ALA A P2	U - PRT 2 - MASSA	D.C.	5
X	C6	AL147	6		ALA A P20-1	V - PRT 2 - 1	A.C.	6
					2	2		7
					3	3		5
					4	4		8
					5	5		9
X	C7	AL141	7		ALA A P20-7	V - PRT 2 - 7	CONT.	8
					8	8		4
					9	9		5
X	C8	AL136	8		ALA B ALI 290 J1	T - PRT 2 - X	A.C.	5
						Y		6
						Z		7
						N		10
						Gr		8
						Gr		9

S.T.

Cod.

REVISIONI					
REV	ORD. APPL.	DATA A	DATA M	DATA G	FIRMA
A	C.O. M1 00001	70	01	29	G Dori
B	C.O. M1 00445	70	10	06	

FOR THE CABLES ASSEMBLY
SIDE REF TO DRAW No 78B102204

10 - WHITE
9 - GREEN
8 - BROWN
7 - BLUE
6 - RED
5 - BLACK
4 - YELLOW

△3 - SEE LABELLING INSTRUCTION
DRAWING No 09874 010

△2 - ITEM NUMBERS SHOWN APPLY TO
DRAWING No 78X102196G1

△1-X - PARTS ASSEMBLED
WHEN DELIVERED

NOTES

PER IL MONTAGGIO CAVI
VEDI DIS. 78B102204

10 - BIANCO
9 - VERDE
8 - MARRONE
7 - BLU
6 - ROSSO
5 - NERO
4 - GIALLO

△3 - VEDERE ISTRUZ. MARCATURA
DIS. No 09874 010

△2 - PARTI NUMERATE SECONDO
LISTA DIS 78X102196 G1
(NELLA COLONNA POS. N°)

△1-X - PARTI MONTATE ALLA
SPEDIZIONE

NOTE

SALVO INDICAZIONE CONTRARIA
DIMENSIONI: MILLIMETRI / INCH
TOLLERANZE DIMENS. E DI FORMA VEDI:
PROIEZIONE

SCALA
COD.

MAT.
TT.
FIN.
DISEGNATO 70 GEN. 17
UGGERI
APPROVATO
DISTR.

DESCRIZIONE
MARCAT. E COLLEG.

DISEGNO
78B102197

PAG
1/1

REV
B

68.10.30

78B102198

△1	RIF. REF.	TIPO TYPE	△2 G2		MARCATURA E COLLEGAMENTO CAVI / CABLE CONNECTION AND MARKING △3 — LATO INT. ALL' U.F. SIDE INT. TO PH. UNIT	LATO EST. ALL' U.F. SIDE EST. TO PH.UNIT	FUNZ. FUNCT.	NOTE NOTES
X	C1	NS129	12		ALA A GOC 200 E01	LC - PRT 2 - DAC	Log.	13
					E02		Log.	14
					E03		Log.	12
X	C2	AL100	13		ALA A P1	UC - PRT - +20	D.C.	4
X	C3	AL100	13		ALA A P1	UC - PRT - +20	D.C.	4
X	C4	AL101	14		ALA A P2	UC - PRT - MASSA	D.C.	5
X	C5	AL101	14		ALA A P2	UC - PRT - MASSA	D.C.	5
X	C6	AL202	15		ALA A P20-1	VC - PRT - ACV	A.C.	6
					2			7
					3			5
					4			8
					5			9
X	C7	AL204	16		ALA A P20-7	VD - PRT - CONT	CONT.	8
					8			4
					9			5
X	C8	AL136	17		ALA B ALI 290 J1	TC - PRT - X	A.C.	5
						Y		6
						Z		7
						N		10
						Gr		9
						Gr		8

MONTAGGIO INTERNO ALL 'MPS

					LATO BREAKER	LATO HUBBEL.		
	CX	AL205	18		TD - PRT X1	TD - PRT - ACP		5
					Y1			6
					Z1			7
					N			10
					Gr			9
					Gr			8

S.T.

Cod

REVISIONI					
REV	ORD. APPL.	DATA A	M	G	FIRMA
A	C.O. M1 00001	70	01	29	GDoni
B	C.O. M1 00445	70	10	06	

NOTES

FOR THE CABLES ASSEMBLY SIDE REF TO DRAW No 78B102205

14 - Connector ISI 3
13 - Connector ISI 2
12 - Connector ISI 1

10 - WHITE
9 - GREEN
8 - BROWN
7 - BLUE
6 - RED
5 - BLACK
4 - YELLOW

△3 - SEE LABELLING INSTRUCTION DRAWING No 09874 010

△2 - ITEM NUMBERS SHOWN APPLY TO DRAWING No 78X10219662

△1-X - PARTS ASSEMBLED WHEN DELIVERED

NOTE

PER IL MONTAGGIO CAVI VEDI DIS. 78B102205

14 - Connettore ISI 3
13 - Connettore ISI 2
12 - Connettore ISI 1

10 - BIANCO
9 - VERDE
8 - MARRONE
7 - BLU
6 - ROSSO
5 - NERO
4 - GIALLO

△3 - VEDERE ISTRUZ. MARCATURA DIS. No 09874 010

△2 - PARTI NUMERATE SECONDO LISTA DIS 78X10219662 (NELLA COLONNA POS.No)

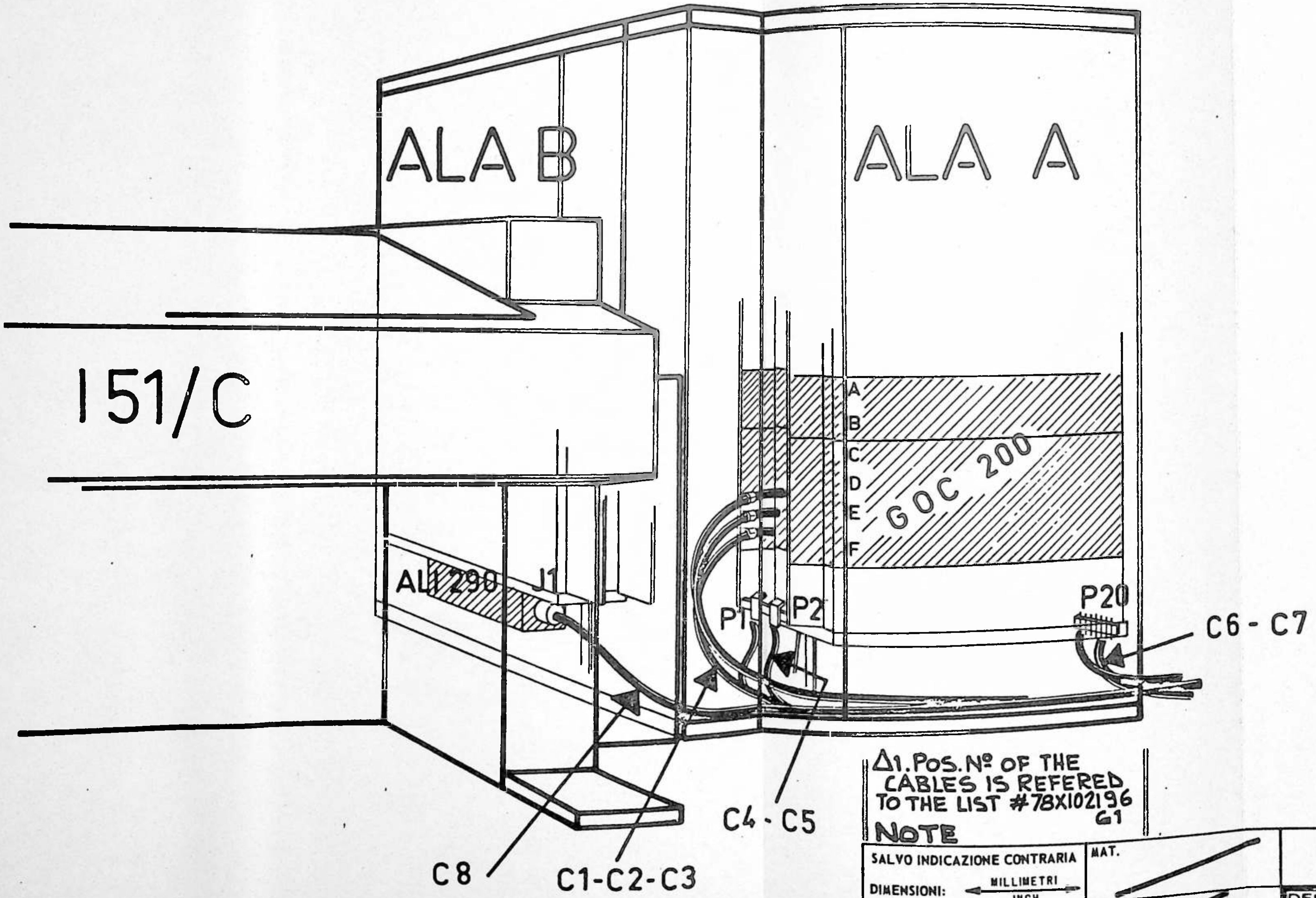
△1-X - PARTI MONTATE ALLA SPEDIZIONE

SALVO INDICAZIONE CONTRARIA DIMENSIONI: MILLIMETRI / INCH TOLLERANZE DIMENS. E DI FORMA VEDI: PROIEZIONE	MAT. TT. FIN.	DESCRIZIONE MARCAT. E COLLEG.
SCALA	COD.	DISEGNATO 70 GEN. 16 UGGERI	DISEGNO 78B102198 · PAG 1/1 · REV B
	APPROVATO	
	DISTR.	

68 10.30

78B102204

REVISIONI					
REV	ORD. APPL.	DATA A	DATA M	DATA G	FIRMA
A	c.o. M1 00001	70	01	29	



△1 POS.N°

C1	3
C2	3
C3	3
C4	4
C5	5
C6	6
C7	7
C8	8

△1. POS. N° OF THE CABLES IS REFERED TO THE LIST #78X102196 G1

NOTE

△1. POS. N° DEI CAVI E' RIFERITO ALLA LISTA N° 78X102196G1

NOTA

SALVO INDICAZIONE CONTRARIA

DIMENSIONI: MILLIMETRI / INCH

TOLLERANZE DIMENS. E DI FORMA VEDI: ____

PROIEZIONE

SCALA

COD.

MAT.

TT.

FIN.

DISEGNATO UGGERI 70 GEN. 20

APPROVATO

DISTR.

DESCRIZIONE

INSTALLAZIONE CAVI

DISEGNO 78B102204

PAG 1/1

REV A

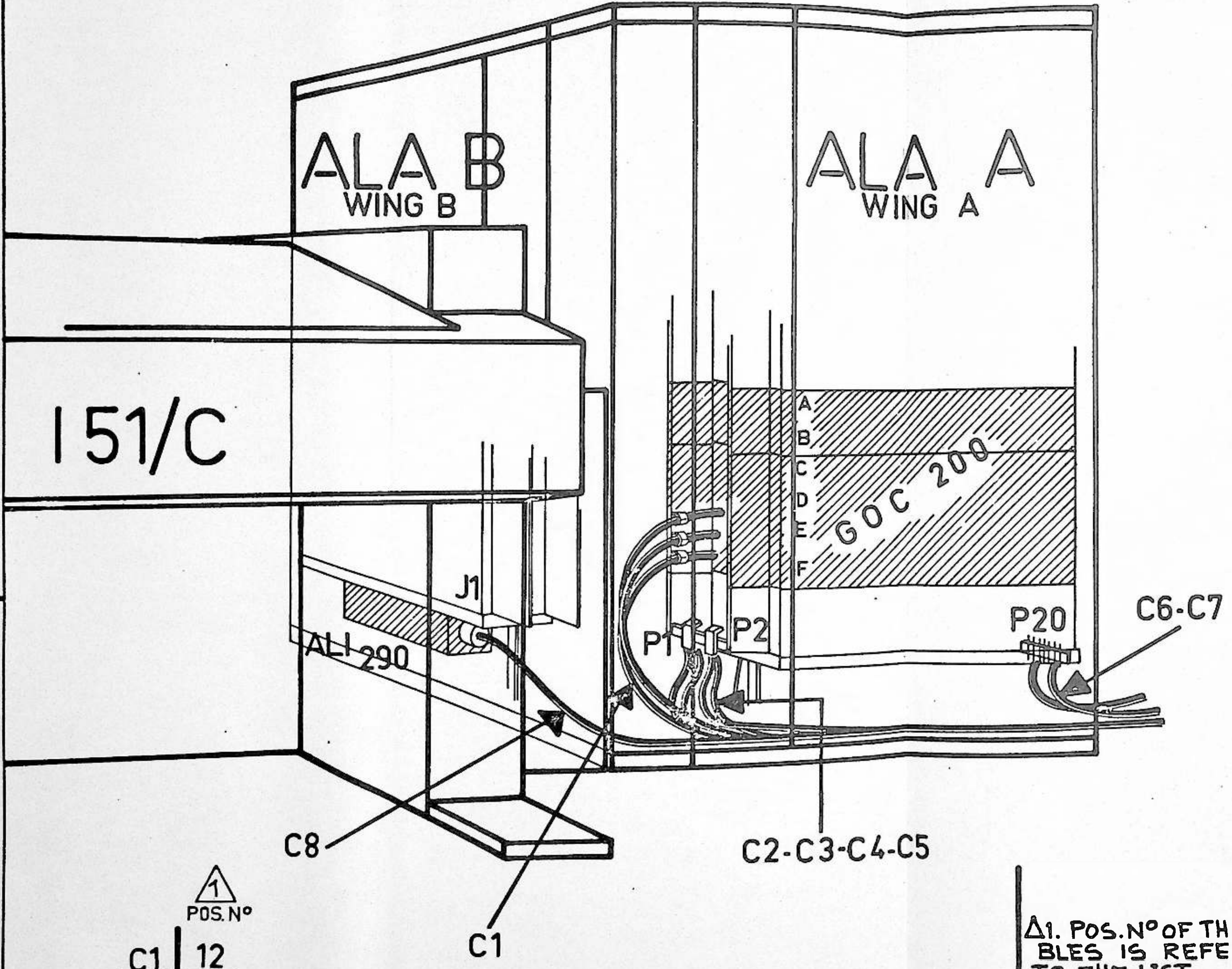
S.T.

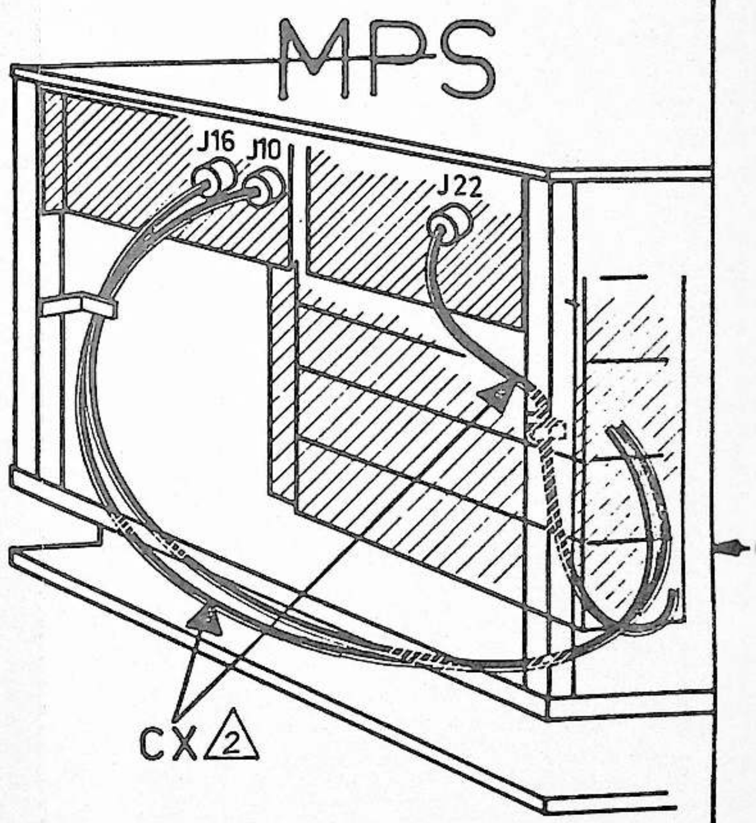
Cod. 3[illegible]104Q

68.10.30

78B102205

REVISIONI					
REV	ORD. APPL.	DATA A	DATA M	DATA G	FIRMA
A	C.O. M1 00001	70	01	29	G Dani





△1 POS.N°	
C1	12
C2	13
C3	13
C4	14
C5	14
C6	15
C7	16
C8	17
△2 CX	18

△1. POS.N° OF THE CABLES IS REFERED TO THE LIST #78X102196 G2

NOTES

△2. IL CAVO CX PUO' ASSUMERE UNA DELLE 3 POSIZIONI IN FUNZIONE DELLA CONN. DA EFF.

△1. POS.N° DEI CAVI È RIFERITO ALLA LISTA N° 78X102196 G2.

NOTE

SALVO INDICAZIONE CONTRARIA
DIMENSIONI: MILLIMETRI / INCH
TOLLERANZE DIMENS. E DI FORMA VEDI:
PROIEZIONE
SCALA
COD.
MAT.
TT.
FIN.
DISEGNATO UGGERI 70GEN 21
APPROVATO
DISTR.

DESCRIZIONE
INSTALLAZIONE CAVI

DISEGNO 78B102205
PAG 1/1
REV A

S.T.

SIMB.	CODICE CODE	DESCRIZIONE DESCRIPTION		QUANTITA QUANTITY					
	0001218 V	FUSIBILE 0,5A	FUSE 0,5A	3					
	0001244 X	FUSIBILE 3A	FUSE 3A	3					
	0001259 V	FUSIBILE 1A	FUSE 1A	3					
	0001220 X	FUSIBILE 1A SB	FUSE 1A S.B	3					
	5575094 6	LAMPADA 60V 0,002A	LAMP 60V 0,002A	1					
	5361011 M	LAMPADA 12V 0,02 A	LAMP 60V 0,02 A	2					

SIGLA PRODOTTO PRODUCT INITIAL	DESCRIZIONE PRODOTTO - PRODUCT DESCRIPTION		RIF. REF.
ALA A 351/C	COV. 351/C	351/C CONTROLLER	1

RIF. - REF.					
1	2	3	4	5	6
0643361 Z					

NOTE

REV.

comp.

emiss. 70.02.27

appr. COM 00031

sez.-sec.

loc.

LISTA RICAMBI - SPARE PARTS LIST

PRT 142.143.144.145.146.147.148.149.163.166.168.169

Rappl.

N° 15024682 0

cont.su fo. / fo. 1

ST

GP

Cod. 39°6077 W

5147 F51C

BULL

PL 429183	FOLIO	REV

✱	ITEM NO	DC	NUMERO IDENTIFICATION	DESIGNATION		G1	G2	G3	G4	G5	G6	G7	G8	UM
	1													
	2	1	2201111	DIODE RG 12 R	PS 2.201100	3								EA
	3	1	2201110	DIODE RG 12	PS 2.201100	3								EA
	4	1	2151413	CARTOUCHE 8A T.	PS 2.151400	3								EA
	5	1	566026	TRIAC SC 400		2								EA
	6	1	564224	THYRISTOR TD		2								EA
	7	1	2200623	DIODE RM 23	PS 2.200600	5								EA
	8	1	2151366	CARTOUCHE 2A	PS 2.151.350	3								EA
	9	1	428829	LAMPE PH LECT		2								EA
	10	1	566053	LAMPE SIGNAL.		2								EA
	11													
	12		2201100	PS DIODE RG		X								
	13		2200.600	PS DIODE RM		X								
	14		2151400	PS CARTOUCHE 8A		X								
	15		2151350	PS CARTOUCHE 2A		X								
	16													

DC - CODES DESSINS

0 - DESSIN ISG
1 - DESS. PRODUIT ACHETE
2 - DESS. A OPTIONS
3 - DESS. MODIFIANT UN PRODUIT DU COMMERCE
4 - DESS. MODIFIANT UN PRODUIT ISG
5 - DESS. AVEC SELECTION DE PIECES AU MONTAGE

UM - UNITES DE MESURE

EA - CHAQUE
IN - INCH
G - GRAMME
CM - CENTIMETRE

✱ DERNIERE MODIFICATION DE LA "PL"

TITRE DOTATION D1

PL 429183	FOLIO 1/1	REV FC

CE DOCUMENT EST LA PROPRIETE DE LA SIB-GE IL NE PEUT ETRE UTILISE REPRODUIT OU COMMUNIQUE SANS AUTORISATION

POUR COMPOSITION ET ETAT DES REVISIONS VOIR FEUILLE ETAT DES REVISIONS

5147 E51C ET CMC7

40

BULL

PL 76X 112 175	IO	REV

✱	ITEM NO	DC	NUMERO IDENTIFICATION	DESIGNATION		G1	G2	G3	G4	G5	G6	G7	G8	UM
	1	0	334363	ENS SABOT	DROIT	1								EA
	2	0	334362	ENS SABOT	GAUCHE	1								EA
	3	0	334361	ENS BANDEAU EQU	D	1								EA
	4	0	334357	ENS BANDEAU EQU	G	1								EA
	5	0	337476	ENS BANDEAU EQU	AR	1								EA
	6	1	54704000	ECROU H ACIER	153545	4								EA
	7	1	50304010	VIS H FENDUE AC	153552	8								EA
	8	1	97304000	ROND DI LARGE	155201	8								EA
	9	1	97804000	ROND DENT EXT	155199	4								EA
	10	1	97604000	ROND PLATE AC	153546	4								EA
	11													
	12		153545	PS ECROU H		X								
	13		153552	PS VIS H		X								
	14		155201	PS ROND		X								
	15		155199	PS ROND		X								
	16		153546	PS ROND		X								

DC - CODES DESSINS

0 - DESSIN ISG
1 - DESS. PRODUIT ACHETE
2 - DESS. A OPTIONS
3 - DESS. MODIFIANT UN PRODUIT DU COMMERCE
4 - DESS. MODIFIANT UN PRODUIT ISG
5 - DESS. AVEC SELECTION DE PIECES AU MONTAGE

UM - UNITES DE MESURE

EA - CHAQUE
IN - INCH
G - GRAMME
CM - CENTIMETRE

✱ DERNIERE MODIFICATION DE LA "PL"

TITRE		
PIECES ACCOMP.		
PL 76X 112 175	FOLIO 1F	REV A

IMPRIME NO C007
SUR SADIAGRAPHE M'

POUR COMPOSITION ET ETAT DES REVISIONS VOIR FEUILLE ETAT DES REVISIONS

CE DOCUMENT EST LA PROPRIETE DE LA SIB-GE IL NE PEUT ETRE UTILISE REPRODUIT OU COMMUNIQUE SANS AUTORISATION

5147 -I51C ET I51CCMC7

BULL

PL 76X112176

FOLIO | REV

*	ITEM NO	DC	NUMERO IDENTIFICATION	DESIGNATION		G1	G2	G3	G4	G5	G6	G7	G8	UM
*	1	1	561701 ~~[illegible]~~	RVBAN ENCRE	136COL 155428	1								EA
	2	1	563047	RUBAN ENCRE	160 COL 155428		1	1						EA
	3	1	563330	LIASSE PAPIER	72G 155 435	1	1	1						EA
	4	1	561280	BANDE PILOTE	20M	1	1	1						EA
	5	0	219984	DISPO CONTR ALIG		1	1	1						EA
	6	1	563464	CLE DYNAMOMET		1	1	1						EA
	7	0	611861	PERFOR BANDE		1	1	1						EA
	8	2	76A112213P00001	RUBAN TRANSFERT	OPTION			1						EA
	9	0	334978	BANDE ANTI MAC		1	1	1						EA
*	10	0	219983	ENS EMBOUT		1	1	1						EA

DC - CODES DESSINS

0 - DESSIN ISG
1 - DESS. PRODUIT ACHETE
2 - DESS. A OPTIONS
3 - DESS. MODIFIANT UN PRODUIT DU COMMERCE
4 - DESS. MODIFIANT UN PRODUIT ISG
5 - DESS. AVEC SELECTION DE PIECES AU MONTAGE

UM - UNITES DE MESURE

EA - CHAQUE
IN - INCH
G - GRAMME
CM - CENTIMETRE

* DERNIERE MODIFICATION DE LA "PL"

TITRE
LIST FOURNITURE

PL 76X112176

FOLIO 1/1 | REV B

CE DOCUMENT EST LA PROPRIETE DE LA SIB-GE IL NE PEUT ETRE UTILISE REPRODUIT OU COMMUNIQUE SANS AUTORISATION

IMPRIME NO C007
SUR SADIAGRAPHE M1

POUR COMPOSITION ET ETAT DES REVISIONS VOIR FEUILLE ETAT DES REVISIONS

RIF. REF.	TIPO TYPO	CODICE CODE	COLLEGAMENTO CAVI CABLES CONNECTION		FUNZ. FUNCT.	NOTE NOTES
			DA FROM	A TO		
1	NS 45	0641233 U	ALA A GOC 100 D01	ALA 2 UCE 430 H03	LOG A	
2	NS 45	0641233 U	ALA A GOC 100 D02	ALA 2 UCE 430 M03	LOG B	
3	NS 45	0641233 U	ALA A GOC 100 D03	ALA 2 UCE 430 I03	LOG D	
4	AL 100	0640401 G	ALA A P1	ALA 2 BARRA +20	D.C.	1
5	AL 101	0640406 M	ALA A P2	ALA 2 BARRA 0	D.C.	2
6	AL 106	0640428 M	ALA B ALI 290 J 1	ALA 3 ALI 080 P3-1	A.C.	2
				2		3
				3		4
				4		5
				5		6
				6		7
7	AL 147	0640656 A	ALA A P20-3	ALA B ALI 310 P1-5	AC. VEN	2
			1	6		3
			2	7		4
			4	4		5
			5	4		6

REVISIONI					
REV	ORD. APPL.	DATA			FIRMA
		A	M	G	

NOTES	NOTE
7- WHITE	7- BIANCO
6- GREEN	6- VERDE
5- BROWN	5- MARRONE
4- BLUE	4- BLU
3- RED	3- ROSSO
2- BLACK	2- NERO
1- YELLOW	1- GIALLO

GE 115/1

SALVO INDICAZIONE CONTRARIA
DIMENSIONI: MILLIMETRI / INCH
TOLLERANZE DIMENS. E DI FORMA VEDI:
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DESCRIZIONE
KIT CAVI I 51-C INTEGR. 250-300-600

4.072.0.521.0

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REV

Mod 1072 - 1

RIF. REF.	TIPO TYPO	CODICE CODE	COLLEGAMENTO CAVI CABLES CONNECTION				FUNZ. FUNCT.	NOTE NOTES
			DA FROM		A TO			
1	NS 45	06412321/	ALA A GOC 200 E01		SIN 440 R24		LOG A	
2	MS 45	0641232Y	ALA A GOC 200 E02		SIN 440 R25		LOG C	
3	NS 45	0641232 Y	ALA A GOC 200 E03		SIN 440 R26		LOG D	
4	AL 100	0640401 G	ALA A P1		ALA2 BARRA +20		D.C.	1
5	AL 101	0640406 M	ALA A P2		ALA2 BARRA 0		D.C.	2
6	AL 166	0640828 M	ALA B ALI290 J 1		ALA3 ALI080 P3-	1	A.C.	2
						2		3
						3		4
						4		5
						5		6
						6		7
7	AL 147	0640656 A	ALA A P20-	3	ALA B ALI310 P1-	5	A.C. VEN	2
				1		6		3
				2		7		4
				4		4		5
				5		4		6

REVISIONI

REV	ORD. APPL.	DATA			FIRMA
		A	M	G	

7- WHITE	7- BIANCO
6- GREEN	6- VERDE
5- BROWN	5- MARRONE
4- BLUE	4- BLU
3- RED	3- ROSSO
2- BLACK	2- NERO
1- YELLOW	1- GIALLO

NOTES

NOTE

GE 115/1

SALVO INDICAZIONE CONTRARIA

DIMENSIONI: MILLIMETRI / INCH

TOLLERANZE DIMENS. E DI FORMA VEDI:

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KIT CAVI I 51-C STANDARD 800-1100

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Mod. 1012 - 1

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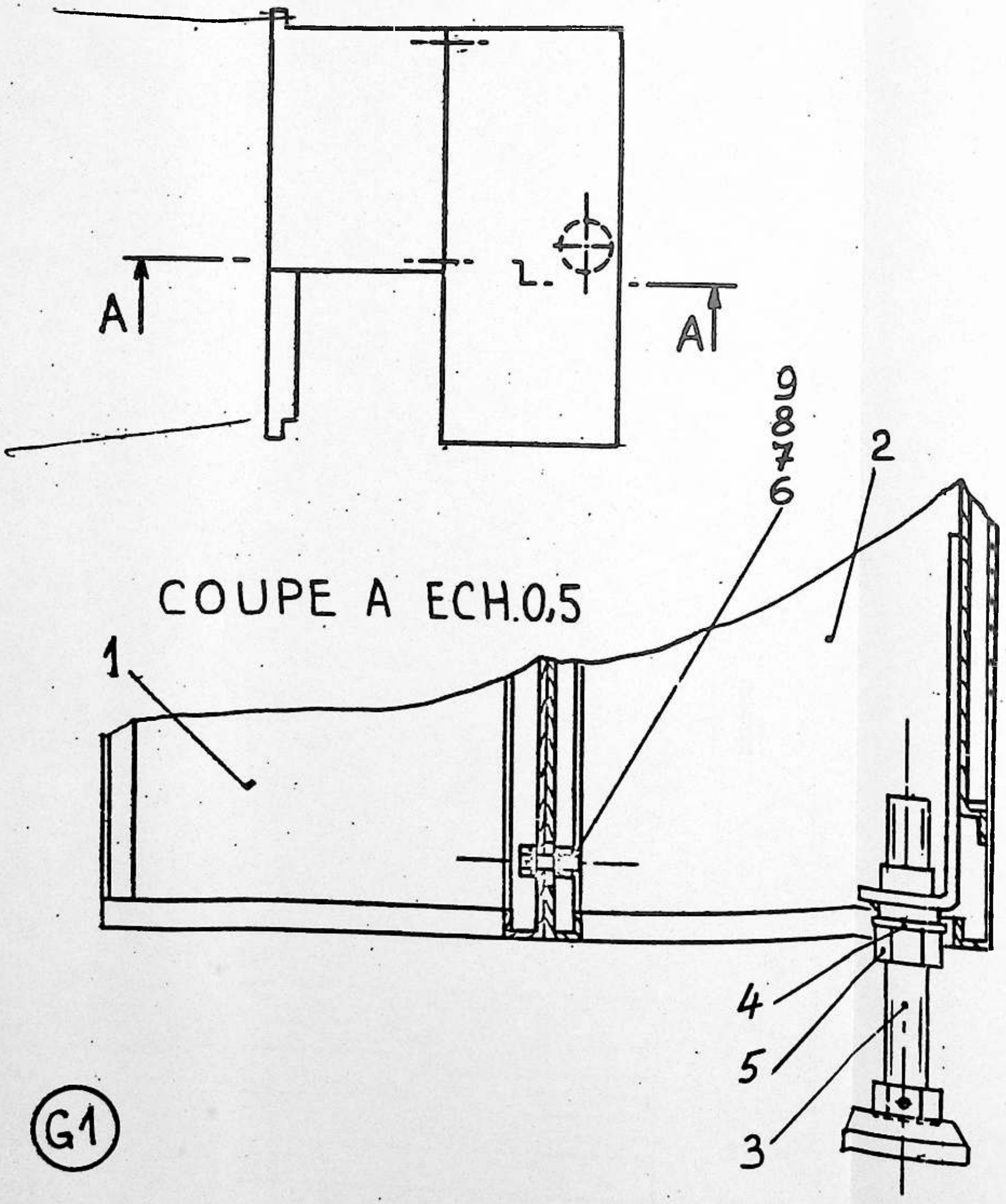
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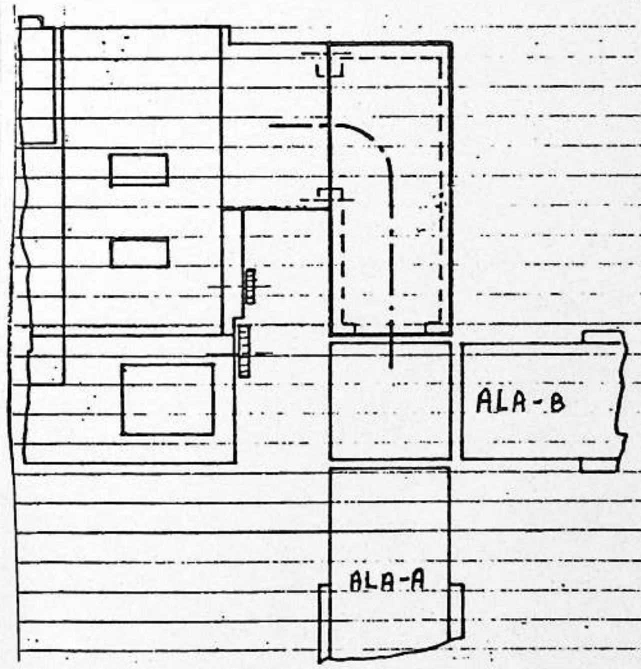

1. POUR COMPOSITION ET INDICE VOIR FEUILLE E.R.

(G1)

SAUF MENTION PARTICULIERE DIMENSIONS = MILLIMETRES / INCHES TOLERANCES DE DIMENSIONS ET DE FORMES : /	MAT. /	BULL	DPT.	LOC. BELFORT	
	T. /	DESIGNATION: CARTER COUDE			
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CE DOCUMENT EST LA PROPRIETE DE LA SIB-GE IL NE PEUT ETRE UTILISE REPRODUIT OU COMMUNIQUE SANS AUTORISATION

IMPRIME NO C002
SUR SADIAGRAPHE MI

BULL

PL 76B111630 | FOLIO | REV

✱	ITEM NO	DC	NUMERO IDENTIFICATION	DESIGNATION	GROUPES ET QUANTITES								UM
					G1	G2	G3	G4	G5	G6	G7	G8	
	1		217600Z	CARTER LATERAL									EA
	2	0	76D111625 G00002	CARTER LIAISON	1								EA
	3	0	450419	ENS VERIN	1								EA
	4	1	97616000	ROND PLATE AC	1								EA
	5	1	94716000	ECROU H ACIER	1								EA
	6	1	90306010	VIS H FENDUE AC	4								EA
	7	1	97306000	ROND DI LARGE	4								EA
	8	1	97606000	ROND PLATE AC	4								EA
	9	1	94706000	ECROU H ACIER	4								EA
	10		153546	PS ROND PLATE	X								
	11		153545	PS ECROU H AC	X								
	12		153552	PS VIS H FENDUE	X								
	13		155201	PS ROND D I L	X								

CE DOCUMENT EST LA PROPRIETE DE LA SIB GE IL NE PEUT ETRE UTILISE REPRODUIT OU COMMUNIQUE SANS AUTORISATION

DC - CODES DESSINS

- 0 - DESSIN ISG
- 1 - DESS. PRODUIT ACHETE
- 2 - DESS. A OPTIONS
- 3 - DESS. MODIFIANT UN PRODUIT DU COMMERCE
- 4 - DESS. MODIFIANT UN PRODUIT ISG
- 5 - DESS. AVEC SELECTION DE PIECES AU MONTAGE

UM - UNITES DE MESURE

- EA - CHAQUE
- IN - INCH
- G - GRAMME
- CM - CENTIMETRE

✱ DERNIERE MODIFICATION DE LA "PL"

TITRE

CARTER COUDE

PL 76B111630 | FOLIO 1/1 | REV A

IMPRIME NO C007
SUR SADIAGRAPHE M1

POUR COMPOSITION ET ETAT DES REVISIONS VOIR FEUILLE ETAT DES REVISIONS

MAINTENANCE

GENERAL ELECTRIC
GENERAL ELECTRIC INFORMATION SYSTEMS ITALIA

I 51 - C

PARALLEL PRINTER SUBSYSTEM

(PRT 142-143-144-145-146-147-148-149-163-166-168-169)

Maintenance

A Field Engineering
publication

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1. OPERATOR TASKS

Note

REFER TO THE MECHANICS MAINTENANCE MANUAL P.N. 4Y514700J31.

2. MAINTENANCE CHECKS

Note

REFER TO THE MECHANICS MAINTENANCE MANUAL P.N. 4Y514700J31.

3. CLEANING AND LUBRICATION

Note

REFER TO THE MECHANICS MAINTENANCE MANUAL P.N. 4Y514700J31.

4. ADJUSTMENTS

ROUTINE : **4.1**

NAME : SPACING CLUTCH SOLENOID CURRENT and STOP TIME

APPARATUS : ALI 310 (for all versions of the I 51-C printer)

DURATION : 1 hr.
PREREQUISITES : None

1 - NEEDED MATERIAL

- Oscilloscope
- Screwdriver, 4 mm blade P.N. 0494059 B
- Tachometric dynamo
- Dynamo coupling

2 - PURPOSE

- The 1/6" single spacing execution time, at high speed (75 cm/sec.), must result less than 10.4 msecs.
  The present routine holds true for both the 1st and 2nd paper movements.

3 - PRELIMINARY CHECKS

1) - The paper drive shaft, upon issue of the spacing clutch command , must reach its rated speed in $\boxed{5.6 \pm 0.2 \text{ msecs}}$

2) - The paper drive shaft, upon end of the spacing clutch command signal, must come to a halt within $\boxed{2.8 \text{ msecs}}$

4 - PROCEDURE

1) - Remove the 1st or 2nd paper movement VFU loop drive sprocket wheel and, in its place, first fix the dynamo coupling and then the tachometric dynamo itself.

2) - Set the paper drive speed change switch to 75 cm/sec (high speed) fitting the 1/6" loop drive sprocket wheel.

3) - Connect dynamo connector 1 to the scope ground and connector 2 to channel A.
Sync EXT "-" on signal MOCAA (L-17-10)

4.a) - Tractors Shaft Rated Speed Check

- Load a single sheet of paper and appropriately adjust the pressure of the paper brake.
- Bring the scope ground level to the bottom of the screen.
- With the subsystem in the STAND-BY status command a manual skip, by either depressing operator panel pushbutton PAPER 1 or PAPER 2 (depending upon which of the tractors is to be checked).
- A waveform similar to the one shown in fig. 4.1 should be obtained.

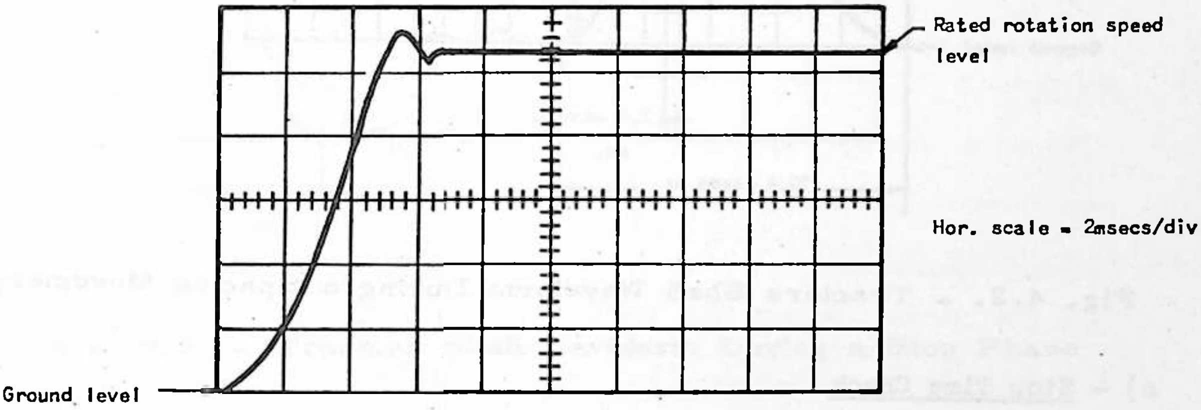


Fig. 4.1. - Tractors Shaft Waveform Revealed During a Manual Skip Command

- Mark the scope screen with a horizontal line in correspondence with the tractors shaft rated speed level.

b) - Spacing Clutch Solenoid Current Setting

- Program a print-out with 1/6" spacings at 75 cm/sec, on either the 1st or 2nd paper movement.
- Rotate pot RV2, physically located on the paper movement box, so as to adjust the spacing clutch solenoid current until the shaft reaches its rated speed in $\boxed{\text{5.6 msecs}}$

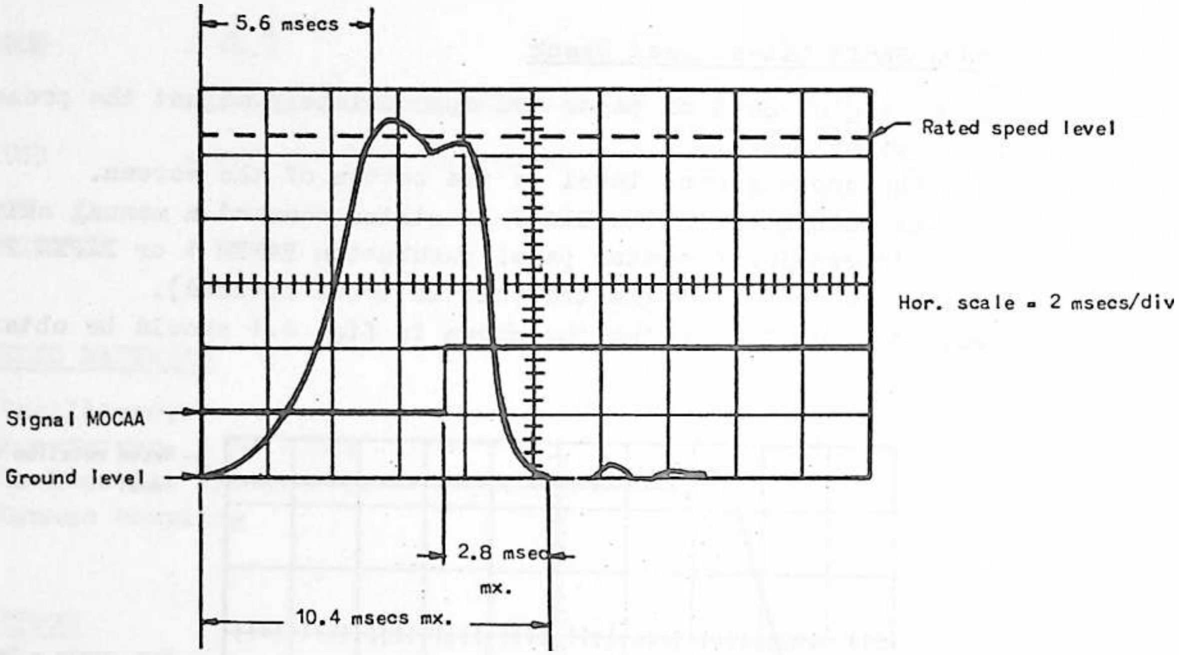


Fig. 4.2. - Tractors Shaft Waveform During a Spacing Movement

c) - Stop Time Check

- Feed signal MOCAA (L-17-10) to the channel B input of a double trace scope.
- Program a print-out with 1/6" spacings at 75 cm/sec (on either the 1st or 2nd paper movement) and ascertain that between the end of MOCAA and when the spacing shaft comes to a halt (that is to say when the trailing edge goes below ground level for the first time), a max of $\boxed{\text{2.8 msecs}}$ elapses.
- Should a double trace scope not be available, check the stop time by swapping from a "-" to a "+" sync.
- In this case a waveform similar to the one illustrated in fig. 4.3 should be observed.

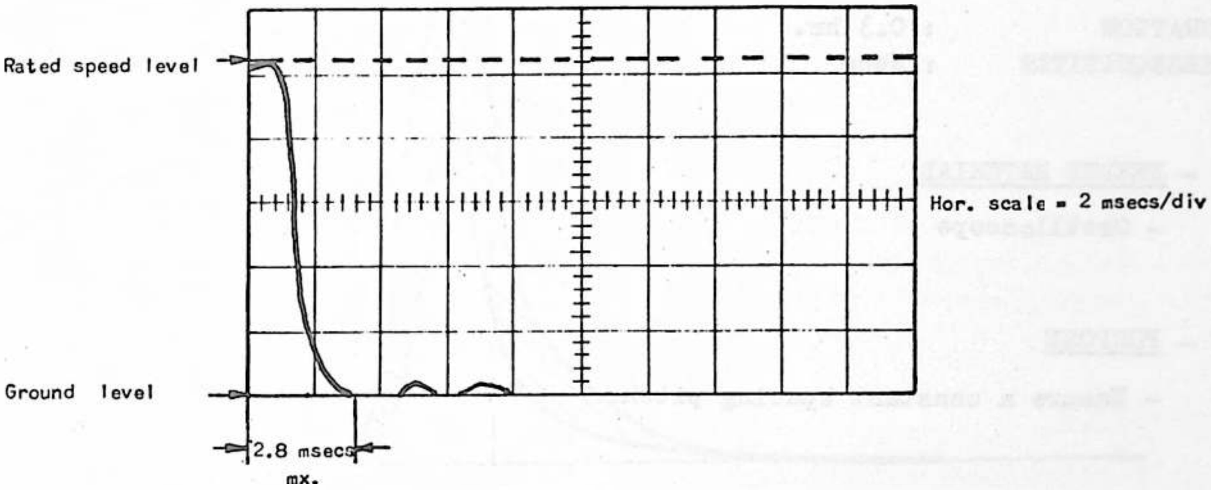


Fig. 4.3. - Tractors Shaft Waveform During a Stop Phase

- Remove the tachometric dynamo coupling and dynamo itself, hence replace the paper movement VFU loop drive sprocket wheel.

5 - FINAL CHECKS

None

ROUTINE : **4.2**

NAME : SPACING BRAKE SOLENOID CURRENT
APPARATUS : ALI 310 (for all versions of the I 51-C printer)
DURATION : 0.3 hr.
PREREQUISITES : None

1 - NEEDED MATERIAL

- Oscilloscope

2 - PURPOSE

- Ensure a constant spacing pitch.

3 - PRELIMINARY CHECKS

1) - The current within the brake solenoid must reach its maximum amplitude within 1.8 msecs from the end of the command issued to the spacing clutch solenoid.

2) - The current must result within the 27 to 57 A range.

3) - After a time elapse of 2 and 5 ms from the moment it reaches its max level, the current must decrease to values below 20 and 5 A respectively.

4 - PROCEDURE

1) - Check for correct setting of the scope voltage scale.

2) - Connect the scope input directly (without attenuation probe) to test point " BRAKE" and scope ground to test point " ⏚ " of the paper movement box under test. EXT + Sync on L-17-10.

3) - Program some spacings.

4) - The scope should reveal a waveform as shown in fig.4.4.
The correct value is obtained by multiplying the waveform voltage level by 20.

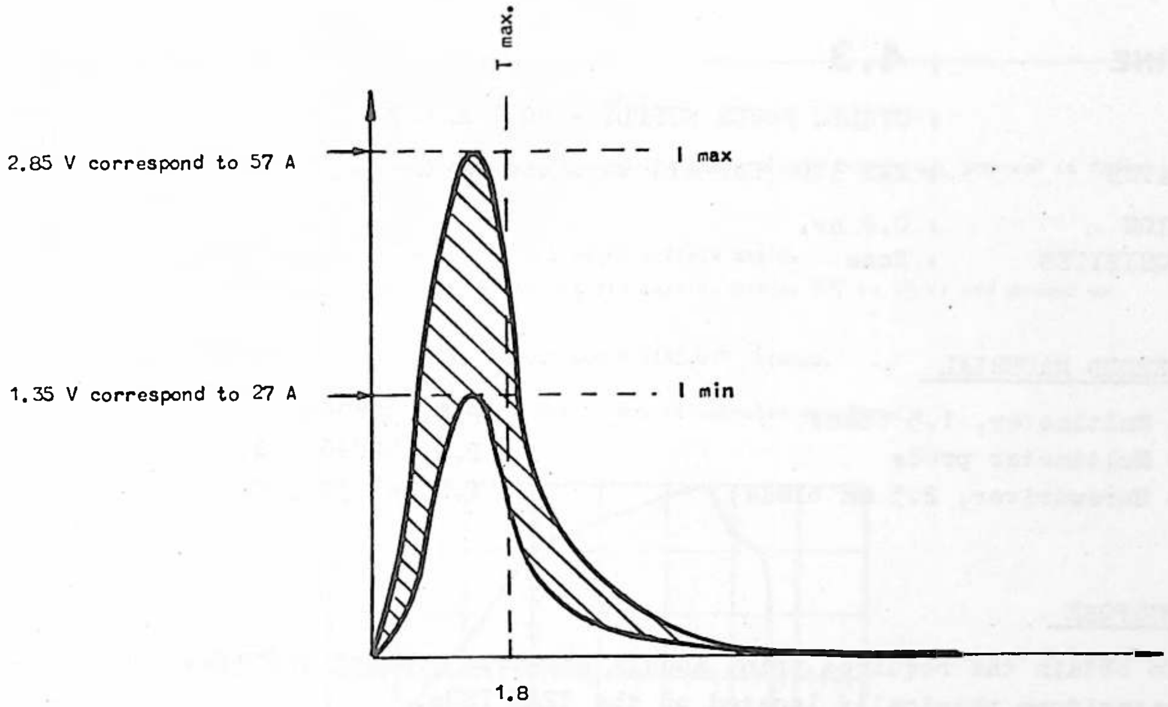


Fig. 4.4. - Spacing Clutch Brake Current Waveform

5 - FINAL CHECKS

None

ROUTINE : **4.3**

NAME : CYCLIC POWER SUPPLY + 60 V ADJUSTMENT
APPARATUS : ALI 310 (for all versions of the I 51-C printer)
DURATION : 0.2 hr.
PREREQUISITES : None

1 - NEEDED MATERIAL

- Multimeter, 1.5 class	P.N. 5282624 A
- Multimeter prods	P.N. 5282628 B
- Screwdriver, 2.5 mm blade	P.N. 4355475 P

2 - PURPOSE

To obtain the required print module solenoid command voltage, across the capacitors physically located on the SPAM PWBs.

3 - PRELIMINARY CHECKS

The voltage measured across the SPAM board capacitors (ATA 140) must result $\boxed{+ 60 \pm 1V}$

4 - PROCEDURE

1) - Set multimeter to 100 V DC scale. Connect the positive meter lead to the ATA 140 pin C-40-8 and negative lead to ground.

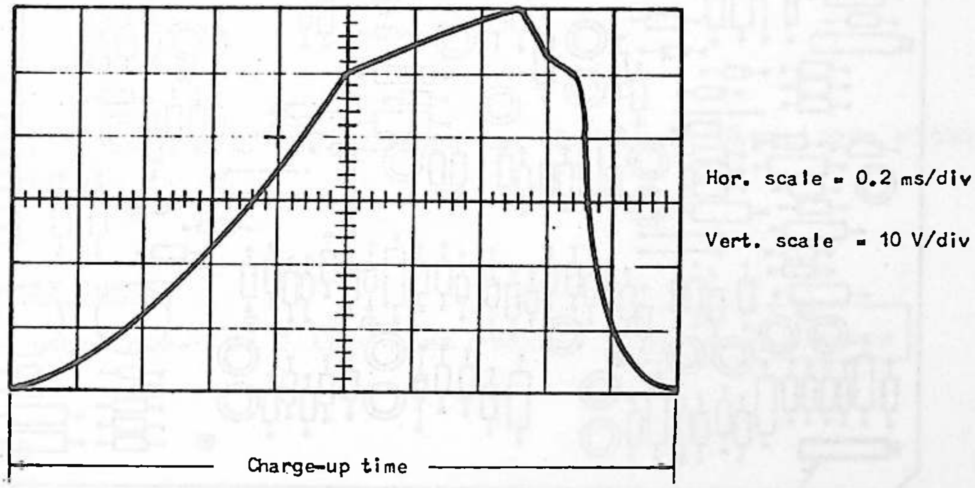
2) - With the subsystem in the "ON DC" and "STAND-BY" status, adjust the LOCO board RV 3 pot until a $\boxed{+ 60 V}$ reading is obtained. Access to pot RV3 may be gained without having to remove the LOCO PWB protection.

Note

To reveal the + 60 V waveform during the cyclic Power Supply charge-up, proceed as follows:

1) - Check for correct setting of the scope voltage scale.
2) - Connect the scope input on the ALI 310 service module TP7 (+ 60 V) and ground on TP8.
3) - Set the subsystem in the "ON DC" and "STAND-BY" status.

The obtained trace should resemble the hereby illustrated waveform:



N.B. This waveform was obtained on a 120 column printer. It is to be remembered that the charge-up time depends upon the number of columns.

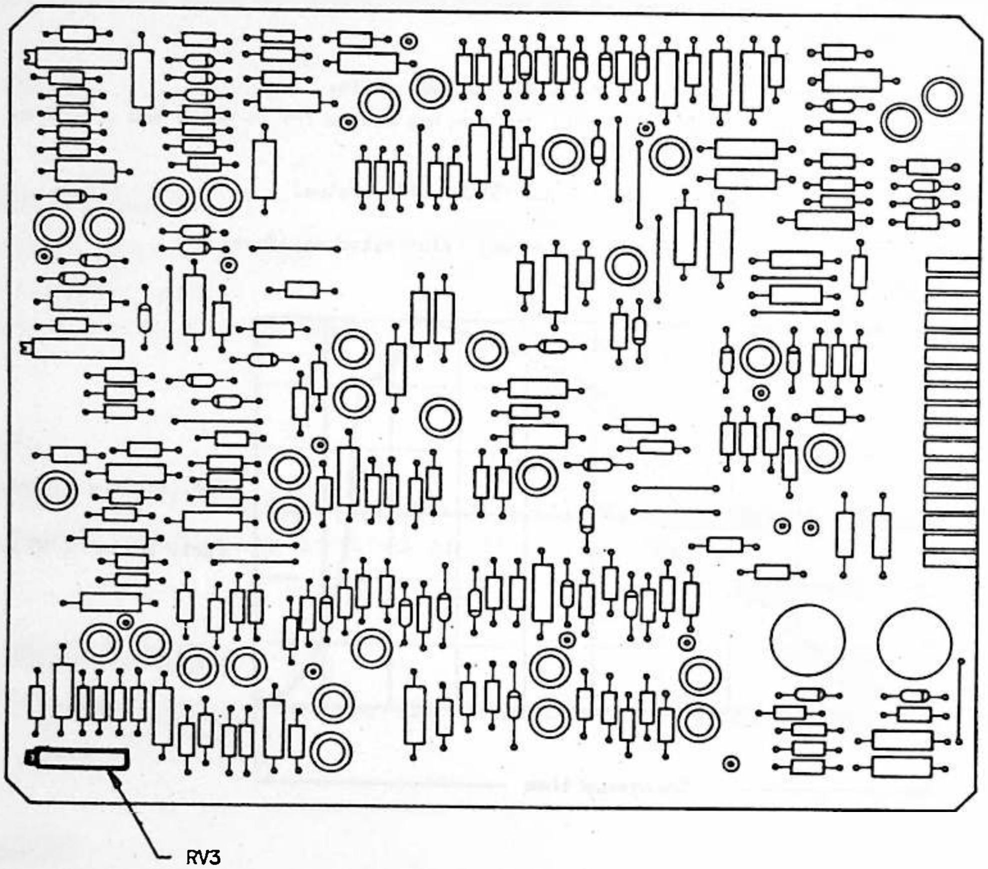


Fig. 4.5. - PWB LOCO

5 - FINAL CHECKS

None

ROUTINE : 4.4

NAME : + 60 V CYCLIC POWER SUPPLY CHARGE TIME

APPARATUS : ALI 310 (for all versions of the I 51-C printer)

DURATION : 0.3 hr.
PREREQUISITES : None

1 - NEEDED MATERIAL

- Oscilloscope
- Screwdriver, 2.5 mm blade P.N. 4355475 P

2 - PURPOSE

The cyclic Power Supply must charge the SPAM board capacitors within a max time of 7.8 msecs.

3 - PRELIMINARY CHECKS

The LOCO board one-shot 2 time must result $\boxed{7.8 \pm 0.3 \text{ msecs}}$

4 - PROCEDURE

1) - Remove the LOCO PWB protection cover, by loosening the 4 screws that fix it to the front ALI 310 panel.
Remove the printer rear right hand side support (leg) cover.

2) - Remove the cyclic Supply power transformer primary fuses F1 to F3 phisically located within the printer right hand side support.

3) - Insert a jumper between the J7 connector points 3 and 4 to exclude the cyclic power Supply protection on the ALI 310 services module.

4) - Connect the scope input to PWB LOCO test point "D" and ground to test point "M".
Sync on INT " - ".

5) - With the subsystem in the "ON DC" and "STAND BY" status, adjust pot RV~~3~~5 to obtain a time of $\boxed{7.8 \text{ msecs}}$

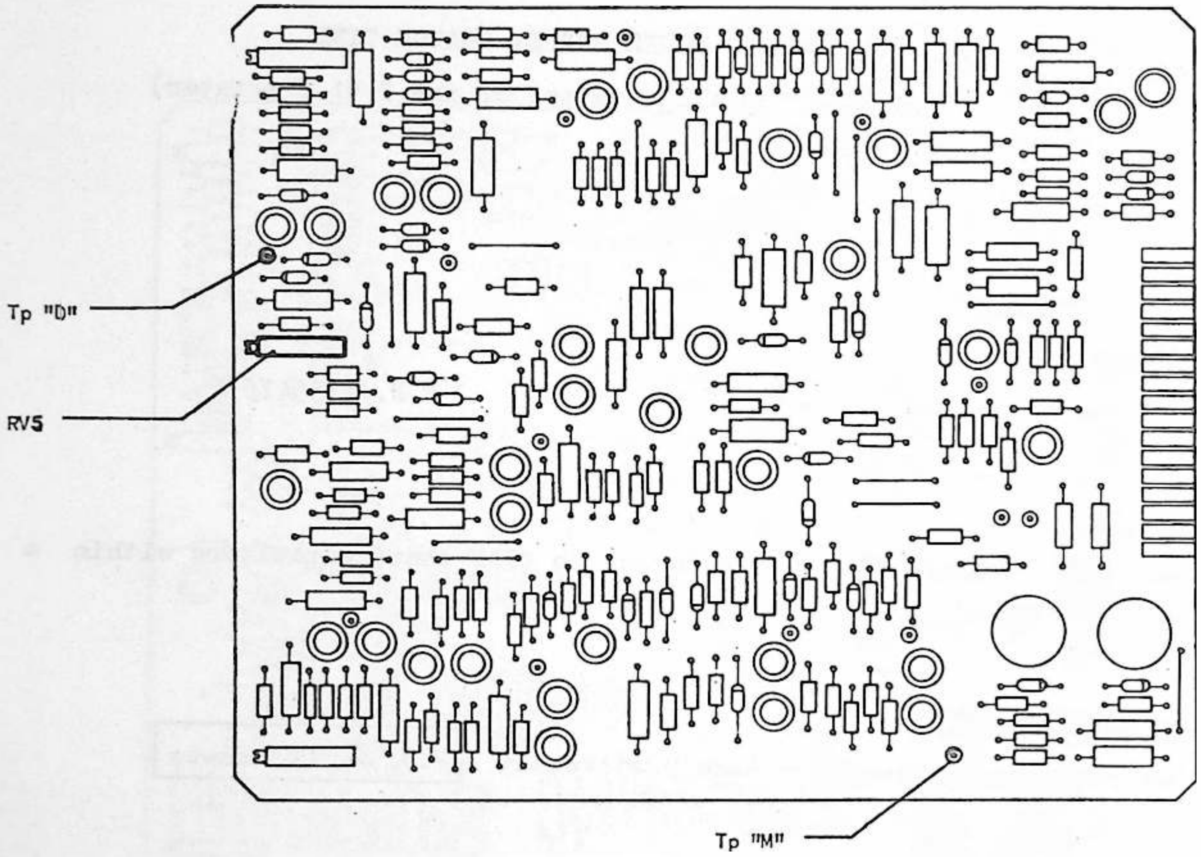


Fig. 4.6. - PWB LOCO

6) - Completed the adjustment, switch-off the subsystem and:

   - replace the fuses
   - remove the jumper

7) - Replace the printer right hand side support cover and the LOCO PWB protection.

5 - FINAL CHECKS

None

ROUTINE : 4.5

NAME : + 60 V CYCLIC POWER SUPPLY WAITING TIME

APPARATUS : ALI 310 (for all version of theI 51-C printer)

DURATION : 0.3 hr.
PREREQUISITES : None

1 - NEEDED MATERIAL

- Oscilloscope
- Screwdriver, blade 2.5 mm P.N. 4355475 P

2 - PURPOSE

The cyclic Power Supply charge must start 8.8 msecs from the end of print (issue of VARI 2) so as to enable the LOMA board SCR diodes cut-off.

3 - PRELIMINARY CHECKS

The LOCO board one-shot 1 time must result $\boxed{8.8 \pm 0.1 \text{ msecs}}$

4 - PROCEDURE

1) - Remove the LOCO PWB protection cover by loosening the 4 screws that fix it to the front ALI 310 panel.

2) - Connect the scope input to PWB LOCO test point "C" and ground to test point "M".
Sync on INT "-".

3) - With the subsystem in the "ON DC" an "STAND-BY" status, adjust pot RV 4 to obtain a time of $\boxed{8.8 \text{ msecs}}$

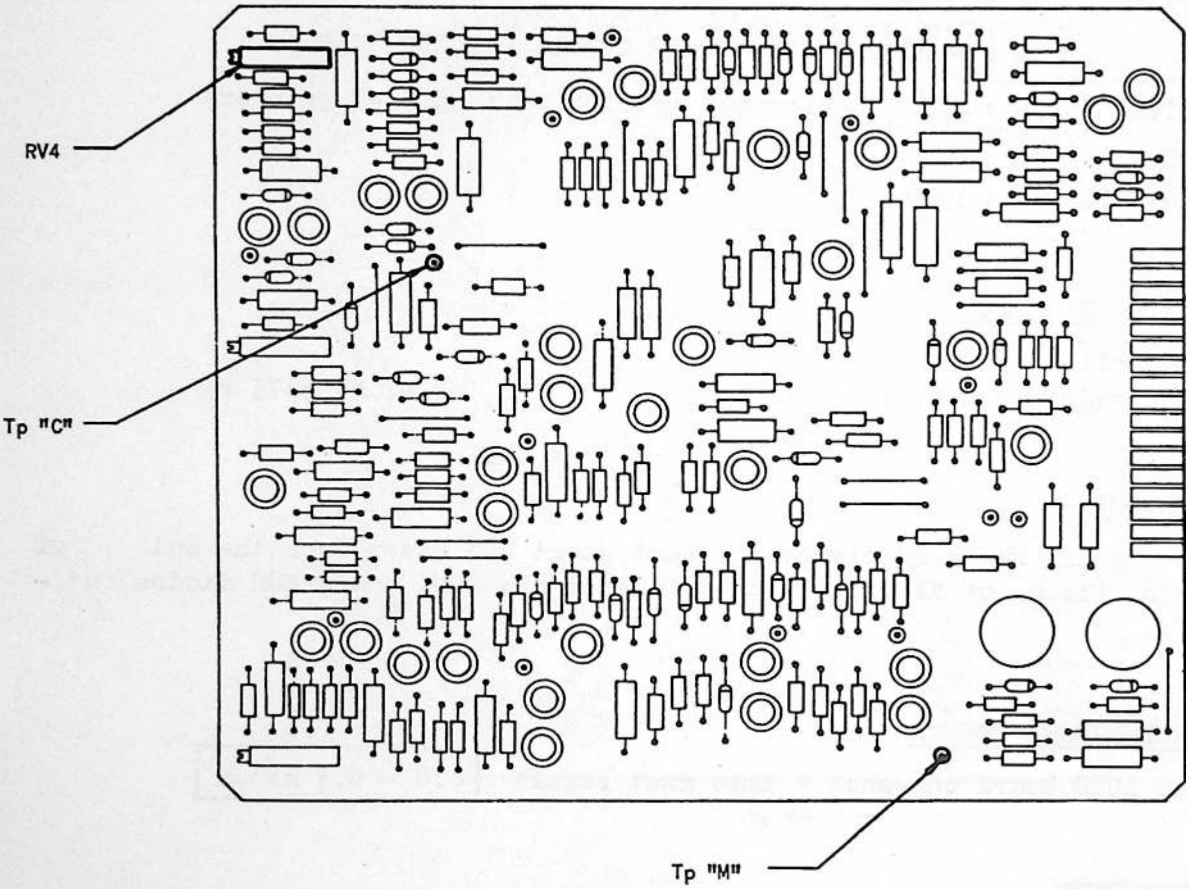


Fig. 4.7. - PWB LOCO

4) - Replace the LOCO board protection cover.

5 - FINAL CHECKS

None

ROUTINE : 4.6

NAME : PHOTODISC, SKIP, SPACING CELLS LAMP VOLTAGE

APPARATUS : ALI 310 (for all versions of the I 51-C printer)

DURATION : 0.3 hr.
PREREQUISITES : None

1 - NEEDED MATERIAL

- Multimeter, 1.5 class	P.N. 5282624 A
- Multimeter prods	P.N. 5282628 B
- Screwdriver, 4 mm blade	P.N. 0494059 B

2 - PURPOSE

To obtain a photodisc, skip, spacing photocells signal of sufficient amplitude to enable the inputs of PWBs DELE and FOGE.

3 - PRELIMINARY

The lamps must have a $\boxed{2.4 \pm 0.1\ \text{V}}$ supply voltage.

4 - PROCEDURE

1) - Remove the printer rear right hand side support (leg) cover.

2) - Set multimeter to the 3 VDC scale.
Place the positive and negative meter leads on terminal strip P3 contacts 1 and 4 respectively (P3 is the topmost terminal strip housed within the printer side support).

3) - With the subsystem in "ON DC",adjust the RV 1 slider until a $\boxed{2.55 \pm 0.1\ \text{V}}$ reading is obtained.
Resistor RV 1 is phisically located on the upper ALI 310 pack and access to it is gained by removing the top grid cover from Wing B.

4) - Replace the printer rear right hand side support (leg) cover.

5) - Replace the Wing B top grid cover.

5 - FINAL CHEKS

None.

ROUTINE : 4.7

NAME : ONE-SHOT TIMINGS

APPARATUS : ATA 140 to 149 for I 51-C versions:

PRT 142 (250 lpm std)
" 143 (340 lpm std)
" 144 (430 lpm CMC7)
" 145 (800 lpm Newsp.label)
" 146 (640 lpm std)
" 147 (730 lpm CMC7)
" 148 (800 lpm Std)
" 149 (1100lpm Std)
" 163 (340 lpm 160 col)
" 166 (640 lpm 160 col)
" 168 (800 lpm 160 col)
" 169 (1100lpm 160 col)

DURATION : 1.6 hr.
PREREQUISITES : None

1 - NEEDED MATERIAL

- Oscilloscope	
- Screwdriver, 2.5 mm blade	P.N. 4355475 P
- Soldering iron	P.N. 7144451 X

2 - PURPOSE

To obtain correct duration (signal length) of the below listed signals:

- SOBO 1: Delayed photodisc clock for resetting of the realignment flip flops.
- COCI 1: Cyclic Power Supply and LOMA PWB check timer.
- MONO A: Inked ribbon movement command.
- ATT 11: 1st paper movement enable spacing clock read delay.
- ATT 21: 2 nd paper movement enable spacing clock read delay.
- TI 201: 2nd paper movement spacing clock.
- SORI 1: MORUA command photodisc clock
- MORUA : Character drum speed check
- RIVA 1: PRT 142 - 250 lpm version, enable cyclic Power Supply charge delay.
- INOC 1: PRT 144/147-CMC7 version, printer busy timing.
- INMO 1
  REMO 1 : Times the CMC7 ribbon movement with CMC7 print/PRT 144-147

- MOCO 1
  REAN 1 : Times the CMC7 ribbon movement with standard print/PRT 144-147
- RITE A: Delays COSU 1 upon CMC7 subsystem power-up/PRT 144-147

3 - PRELIMINARY CHECKS

None

4 - PROCEDURE

The one-shot timings must correspond to the following table :

SIGNAL	TIME	TOL %	PWB ROW	PWB POS	PIN	POT	NOTES
SOBO 1	2.5 /us	± 5	I	33	10	Lower	
COCI 1	12 ms	± 5	L	18	10	Lower	
MONO A	1.5 secs	± 10	L	20	14	*	
ATT 11	5.5 ms	± 5	L	18	01	Upper	
ATT 21	5.5 ms	± 5	G	24	01	Upper	With 2nd paper mov.-Opt. OPZ 141
TI 201	1.2 /us	± 5	G	24	10	Lower	With 2nd paper mov. - Opt. OPZ 141
SORI 1	50 /us	± 5% on SORI + MORU A sum	I	33	01	Upper	
MORU A	950 /us		L	27	14	* *	With PRT 149-169 (1100 lpm) ATA148
MORU A	1350 /us						With PRT 145-146-148-166-168 (640/800 lpm) ATA 147
MORU A	1450 /us						With PRT 144-147 (CMC7) ATA 142
MORU A	2700 /us						With PRT 142-143-163 (250 / 340 lpm) ATA 146 - 149
RIVA 1	60 ms	± 5	L	25	14	* *	With PRT 142 (250 lpm) ATA 149
INOC 1	56 ms	± 5	G	27	14	* *	With PRT 144-147 (CMC7) ATA 142
INMO 1	10 to 18 ms	-	I	27	01	Upper	With PRT 144-147 (CMC7) ATA 142
REMO 1	10 to 18 ms	-	I	27	10	Lower	With PRT 144-147 (CMC7) ATA 142
MOCO 1	7 to 13 ms	-	I	29	01	Upper	With PRT 144-147 (CMC7) ATA 142
REAN 1	7 to 13 ms	-	I	29	10	Lower	With PRT 144-147 (CMC7) ATA 142
RITE A	35 ms	± 10	G	30	14	* *	With PRT 144-147 (CMC7) ATA 142

* = Slow recovery one-shot (ULUN A) without adjust pot.

** = Fast recovery one-shot (UNRA B) without adjust pot.

1) - SOBO 1, COCI 1 Timing

- Connect the scope input on the signal that is to be checked. Sync on INT "+".
- Switch the subsystem on and adjust the appropriate one-shot pot,

2) - MONO A Timing

- Connect the scope input on L-20-14. EXT " - " sync on L-20-03.
- With the subsystem in STAND-BY and the NO SKIP 1 pushbutton operated (lamp lit), depress pushbutton PAPER 1 to perform a spacing.
  The observed signal must be at level 0 for 1.5 secs.
- To appropriately adjust the time, vary the one-shot capacitance. The capacitors are fitted on the ULUN-A board positions C1 to C8. Remember that the positive capacitor lead must be soldered on the innermost PWB run pad (facing the centre of the PWB).

3) - ATT 11, ATT 21, TI 20 1 Timing

- Connect the scope input on the signal that is to be checked. Sync on INT " + ".
- In order to reveal ATT 11, either program some spacings on the 1st paper movement or command some manual spacings through the operator panel (pushbutton PAPER 1 with NO SKIP 1).
  To reveal ATT 21 and TI 20 1, either program spacings on the 2nd paper movement or command manual spacings through the operator panel (pushbutton PAPER 2 with NOSKIP 2).
- Appropriately vary the pertinent one-shot adjustment pot to obtain the correct time.

4) - SORI 1 + MORU A Timing

- Connect the scope input to loc I-33-01 (SORI 1). Sync on INT " + ".
- Switch the subsystem on and proceed to appropriately adjust the upper pot on the PWB in loc. I-33.
- Remove the PWB in loc. L-20 , replacing it with the one in L-27.
- Connect the scope input to loc L-20-14 (MORU A). EXT " - " sync on L-20-3.
  Command some manual spacings. Such a sync will reveal the timing

of MORUA which summed with that of SORI 1 (previously observed) must result:

- . 1000 μs for PRT 1100 lpm (PRT 149-169)
- . 1400 μs for PRT 640/800 lpm (PRT 145-146-148-166-168)
- . 1500 μs for PRT CMC 7 (PRT 144-147)
- . 2750 μs for PRT 250/340 lpm (PRT 142-143-163)

With a 5% tolerance on the sum of SORI 1 + MORU A.

- To appropriately adjust the time of MORU A, vary the one-shot capacitance.
  The capacitors are located on PWB UNRA-B positions C2 to C8. Remember that the positive capacitor lead must be soldered on the innermost PWB run pad (facing the center of the PWB).
- Precise setting of MORUA by varying the capacitors result extremely difficult therefore, to obtain a fast and exact SORI 1 + MORU A duration, it is advisable to pre-set a SORI 1 time of 40 to 80μsecs.
- Replace the PWBs in their original locations.

5) - RIVA 1 Timing (applicable to PRT 142, 250 lpm printers)

- Connect the scope input to loc L-25-14.
  EXT " - " sync on L-25-3.
- Print.
  The revealed signal must be at level 0 for 60 msecs.
- To adjust the time, vary the one-shot capacitance.
- The capacitors are located on PWB UNRA-B positions C2 to C8. Remember that the positive capacitor lead must be soldered on the innermost PWB run pad (facing the centre of the PWB).

6) - INOC 1 Timing (applicable to PRT 144-147, CMC7 printers)

- Set the machine for a CMC7 print (CMC7 lamp, on the operator's panel, must be lit).
- Connect the scope input on G-27-14.
  EXT " - " sync on G-27-3.
- Program some spacings.
  The revealed signal must be at level 0 for 56 msecs.
- To adjust the time, vary the one-shot capacitance.
  The capacitors are located on PWB UNRA-B positions C2 to C8. Remember that the positive capacitor lead must be soldered on the innermost PWB run pad (facing the centre of the PWB).

7) - INMO 1 + REMO 1 Timing (applicable to PRT 144-147, CMC7 printers)

- The one-shots must be adjusted as specified in par. 2.5 of Maintenance Manual P.N. 4Y514700J31FA.

8) - MOCO 1 + REAN 1 Timing (applicable to PRT 144-147, CMC7 printers)

- This adjustment must be carried out after the settings implemented at step 7, above, have been accomplished.
- The reduction in quantity of CMC7 tape advancement, when both Standard and CMC7 character lines are to be printed, depends upon the customer's program.

  One-shots MOCO 1 and REAN 1 must therefore be so adjusted that , with the customer's program, the overlap of Std. character prints on the same position of the CMC7 tape does not impair the print - out quality.

  Remember that both one-shots must have the same duration.

9) - RITEA Timing (applicable to PRT 144-147, CMC7 printers)

- Connect the scope input on signal tapped from loc. L-20-14. EXT " - " sync L-20-3.
- Remove the PWB in L-20, replacing it with the one in G-30.
- With the machine in STAND-BY and the NO SKIP 1 pushbutton operated (lamp lit), depress PAPER 1 to perform a manual spacing. The revealed signal must be at level 0 for 35 msecs.
- To adjust the time, vary the one-shot capacitance. The capacitors are located on PWB UNRA-B positions C2 to C8. Remember to always solder the positive capacitor lead on the innermost PWB run pad (that is to say, facing the centre of the PWB).
- Replace the PWBs in their original locations.

5 - FINAL CHECKS

None.

ROUTINE : 4.8

NAME : PRINT ALIGNMENT

APPARATUS : ATA 140 (for all versions of the I 51-C printer)

DURATION : 0.3 hr.
PREREQUISITES : None

1 - NEEDED MATERIAL

- Alignment ruler	P.N. 219984 Z
- Screwdriver, 2.5 mm blade	P.N. 4355475 P

2 - PURPOSE

To obtain an aligned print-out.

3 - PRELIMINARY CHECKS

- The misalignment of a row having all equal characters (Es) must not be greater than ± 0.05 mm (for 250-340-640 lpm printers) and ± 0.10 mm (for 800-1100 lpm printers).

4 - PROCEDURE

1) - Load stationery having a weight of 72 g/m^2.

2) - Carry out a complete print-out of Es on all columns.

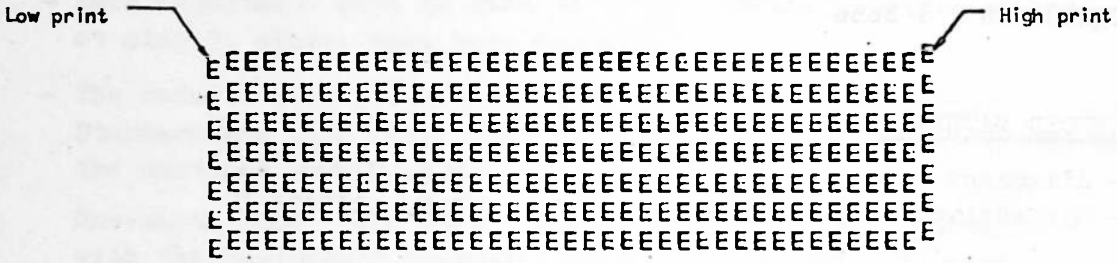
3) - Tear off the print-out and, placing it on a flat surface, fix it with strips of adhesive tape.

4) - Place the check ruler over the print-out sample so that its lower red reference line coincides with the lowest edge of that group of Es having best alignment.

5) - Fix the ruler in this position with strips of adhesive tape.

6) - Correctly focus the optical ruler group and proceed to slide it, scanning the print, in order to find the Es that exceed the given tolerance.
In measuring the misalignment, remember that the reference lines on the ruler are 2/10 mm apart.

To raise the print, rotate the appropriate column PWB pot counter-clockwise.
To lower the print, rotate the pot clockwise.



Print-out Example at 1100 lpm

The below described procedure enables to carry out the alignment when, because of the increased air gap between hammer armature and coil (excessive armature delrin stop wear), the print delay cannot be taken up by the full rotation of the adjust pot.

Should therefore result impossible to obtain a correct column alignment, because the pertinent adjust pot slider has reached its end of run stop, proceed to re-synchronize the photodisc, so as to advance the print, and implement a new all column alignment in order to trim up the new print lead given by the photodisc.

Note
When having to adjust the alignment of the 1st row of print after a long period of machine inactivity, remember to clean the hammer armature delrin stop first.

5 - FINAL CHECKS

None

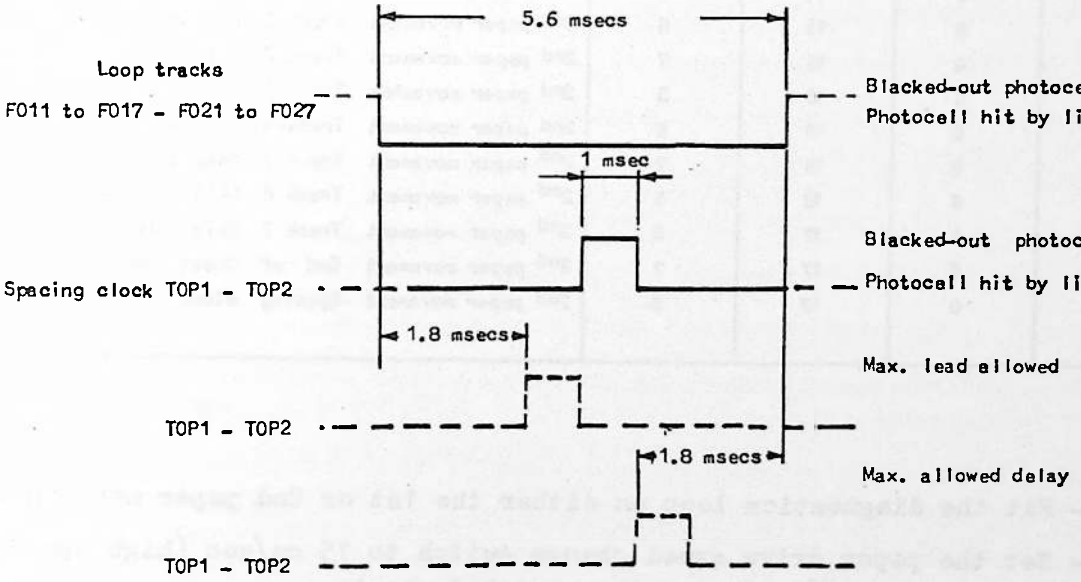
ROUTINE	: **4.9**
NAME	: END of SPACINGS and VFU LOOP SKIP HALT SIGNALS SYNC
APPARATUS	: ATA 140 (for all versions of the I 51-C printers)
DURATION	: 0.5 hr.
PREREQUISITES	: Ascertain for correct skip lamps voltage level. Refer to routine 4.6.

1 - NEEDED MATERIAL

- Oscilloscope
- Diagnostics loop

2 - PURPOSE

To obtain correct skip halts.
The spacing clock (TOP 1 or TOP 2) must result centered with respect to the signal issued by the loop tracks 1 to 7 halt hole (FO 11 to FO 17 or FO 21 to FO 27).



3 - PRELIMINARY CHECKS

None

4 - PROCEDURE

The amplifier output signals must have a 5 to 8V amplitude, when their respective photocells are hit by light, and a 0V level, when they are blacked-out.

SIGNAL	PWB ROW	PWB POS	PIN	NOTES
F011 N	G	12	6	1st paper movement Track 1 Skip halt
F012 N	G	12	7	1st paper movement Track 2 Skip halt
F013 N	G	12	5	1st paper movement Track 3 Skip halt
F014 N	G	13	6	1st paper movement Track 4 Skip halt
F015 N	G	13	7	1st paper movement Track 5 Skip halt
F016 N	G	13	5	1st paper movement Track 6 Skip halt
F017 A	G	14	6	1st paper movement Track 7 Skip halt
F018 A	G	14	7	1st paper movement End of Sheet signal
TOP1 A	G	14	5	1st paper movement Spacing clock
F021 N	G	15	6	2nd paper movement Track 1 Skip halt
F022 N	G	15	7	2nd paper movement Track 2 Skip halt
F023 N	G	15	5	2nd paper movement Track 3 Skip halt
F024 N	G	16	6	2nd paper movement Track 4 Skip halt
F025 N	G	16	7	2nd paper movement Track 5 Skip halt
F026 N	G	16	5	2nd paper movement Track 6 Skip halt
F027 A	G	17	6	2nd paper movement Track 7 Skip halt
F028 A	G	17	7	2nd paper movement End of Sheet signal
TOP2 A	G	17	5	2nd paper movement Spacing clock

1) - Fit the diagnostics loop on either the 1st or 2nd paper movement.

2) - Set the paper drive speed change switch to 75 cm/sec (high speed) fitting the 1/6" loop drive sprocket wheel.

3) - Fetch in the pertinent loop tracks on scope channel A.

4) - Fetch in the pertinent spacing clock (G-14-5/1st paper movement or

G-17-5/2nd paper movement) on scope channel B.

5) - EXT "-" sync on channel A input (loop track under test)

6) - Depress the involved paper movement PAPER pushbutton to perform a skip.
The spacing clock signal must be centered with respect to the skip loop track signals as shown in par.2 (PURPOSE).

5 - FINAL CHECKS

None

ROUTINE : 4.10

NAME : ONE-SHOT TIMINGS

APPARATUS : GOC 100 for I 51-C versions:

PRT 142 (250 lpm Std.)
" 143 (340 lpm Std.)
" 144 (430 lpm CMC7)
" 146 (640 lpm Std.)
" 163 (340 lpm 160 col.)
" 166 (640 lpm 160 col.)

DURATION : 1.5 hr.
PREREQUISITES : None

1 - NEEDED MATERIAL

- Oscilloscope	
- Screwdriver, 2.5 mm blade	P.N. 4355475 P
- Soldering iron	P.N. 7144451 X

2 - PURPOSE

To obtain correct duration of the following signals:

- LIM 1: MON 1 N one-shot command
- MON 1 N: 1st paper movement restore time
- LIM 2 : MON 2 N one-shot command
- MON 2 N : 2nd paper movement restore time
- DUS 1 N : 1st paper movement skip duration check
- DUS 2 N : 2nd paper movement skip duration check
- REFU : Restore time before the machine becomes available after the paper movement.
- LICA : Delays the paper movements command upon end of print
- LIIM : Print inhibition for hammer recovery.

3 - PRELIMINARY CHECKS

None

4 - PROCEDURE

The one-shot timings must correspond to the following table :

SIGNAL	TIME	TOL %	PWB ROW	PWB POS	PIN	POT LOC	NOTES
LIM1	2 ms	±10% on	C	14	01	Upper	
MON1 N	20 ms	the sum	B	24	14	*	
LIM2	2 ms	±10% on	A	14	01	Upper	With 2nd paper mov. - Opt. OPZ 101
MON2 N	20 ms	the sum	A	16	14	*	With 2nd paper mov. - Opt. OPZ 101
DUS1 N	2 secs	±10	B	17	14	* *	
DUS2 N	2 secs	±10	A	17	14	* *	With 2nd paper mov. - Opt. OPZ 101
REFU	1 ms	± 5	C	14	10	Lower	
LICA	2 ms	± 5	D	21	01	Upper	
LIIM	18.8 ms	± 3	D	21	10	Lower	

* Fast recovery one-shot (UNRA B) without adjust pot.

** Slow recovery one-shot (ULUN A) without adjust pot.

1) - LIM1 + MON1 N / LIM2 + MON2 N Timing

- Connect scope input on C-14-01 (LIM1) or A-14-01 (LIM2).
  Sync on INT "+".
- Program some spacings on either the 1st or 2nd paper movements, for either LIM1 or LIM2 respectively, and proceed to vary the appropriate one-shot pot.
- Connect scope input on B-24-14 (MON1 N) or A-16-14 (MON2 N).
  Sync on INT "-".
  With such a sync, reveal the time of either LIM1 + MON1 N or LIM2 + MON2 N which must be at level 0 for 22 msecs.
- To adjust the time, vary the one-shot capacitance.
  The capacitors are located on PWB UNRA-B positions C2 to C8.
  Remember to always solder the positive capacitor lead on the innermost PWB run pad (that is to say, facing the centre of the PWB).
- Precise setting of MON1 N or MON2 N by varying the capacitors results extremely difficult therefore, to obtain a quick and exact LIM1 + MON1 N or LIM2 + MON2 N duration, pre-set a LIM1 or LIM2 time of 1 to 3 msecs.

2) - DUS1 N, DUS2 N Timing

- Connect the scope input on the ATA 140 signal, loc. L-20-14. EXT "-" sync on L-20-3.
- Remove the PWB in L-20.
- Remove the PWB in loc. B-17 (DUS1 N) or A-17 (DUS2 N) and insert it in loc. L-20.
- With the machine in STAND-BY and the NO SKIP 1 pushbutton operated (lamp lit), depress PAPER 1 to perform a spacing. The revealed signal must be at level 0 for 2 secs.
- To adjust the time, vary the appropriate one-shot capacitance. The capacitors are fitted on PWB ULUN-A positions C1 to C8. Remember to always solder the positive capacitor lead on the innermost PWB run pad (that is to say, facing the centre of the PWB).
- Replace the PWBs in their original locations.

3) - REFU, LICA, LIIM Timing

- Connect the scope input on the signal that is to be checked. Sync on INT "+".
- Program the print-out and vary the pertinent one-shot adjust pot.

5 - FINAL CHECKS

None.

ROUTINE : 4.11

NAME : ONE-SHOT TIMINGS

APPARATUS : GOC 200 for I 51-C versions :
PRT 145 (800 lpm - Newspaper label)
PRT 147 (730 lpm - CMC7)
PRT 148 (800 lpm - Std.)
PRT 149 (1100 lpm - Std.)
PRT 168 (800 lpm - 160 col.)
PRT 169 (1100 lpm - 160 col.)

DURATION : 2 hr.
PREREQUISITES : None

1 - NEEDED MATERIAL

- Oscilloscope
- Screwdriver, 2.5 mm blade P.N. 4355475 P
- Soldering iron " 7144451 X

2 - PURPOSE

To obtain correct duration of the following signals :

- DEM1 : MON1 N one-shot command
- MON1 N : 1st paper movement restore time
- DEM2 : MON2 N one-shot command
- MON2 N : 2nd paper movement restore time
- SIC1 N : 1st paper movement skip duration check
- SIC2 N : 2nd paper movement skip duration check
- RES1 : Skip re-set in case of excessive skip duration
- LICA : Delays the paper movements command upon end of print
- TERI : 1st TE10 - character request to CPU - generator clock
- R160 : End buffer scan command
- FISA : End of print clock
- RERI : Delays issue of the scan with each clock to avoid introducing noises on the LOSP boards.
- TU00 : Delayed CPU TU20 clock.

3 - PRELIMINARY CHECKS

None.

4 - PROCEDURE

The one-shot timings must correspond to the following table :

SIGNAL	TIME	TOL. %	PWB ROW	PWB POS	PIN	POT LOC	NOTES
DEM1	1 ms	±5 % on the sum	B	32	01	Lower	
MON1 N	14 ms		B	31	14	*	
DEM2	1 ms	±5 % on the sum	A	14	01	Upper	With 2nd paper mov. - Opt. OPZ 201
MON2 N	14 ms		A	13	14	*	With 2nd paper mov. - Opt. OPZ 201
SIC1 N	2 secs	± 10	B	30	14	* *	
SIC2 N	2 secs	± 10	A	12	14	* *	With 2nd paper mov. - Opt. OPZ 201
RES1	2 µs	± 5	B	32	10	Lower	
LICA	2,5 ms	± 5	E	10	10	Lower	
TERI	3 µs	± 5	E	11	01	Upper	
R160	6 µs	± 5	E	11	10	Lower	
FISA	6 µs	± 5	F	08	01	Upper	
RERI	10 µs	± 5	F	08	10	Lower	
TUOO	2 µs	± 5	E	10	01	Upper	

* Fast recovery one-shot (UNRA B) without adjust pot.

** Slow recovery one-shot (ULUN A) without adjust pot.

1) - DEM1 + MON1 N / DEM2 + MON2 N Timing

- Connect the scope input on B-32-1 (DEM1) or A-14-1 (DEM2). Sync on INT "+".
- Program some spacings on either the 1st or 2nd paper movements, for either DEM1 or DEM2 respectively, and proceed to vary the appropriate one-shot pot.
- Connect the scope input on B-31-14 (MON1 N) or A-13-14 (MON2 N). Sync on INT "-".
  With such a sync, reveal the time of either DEM1 + MON1 N or DEM2 + MON2 N which must be at level 0 for 15 msecs.
- To adjust the time of either MON1 N or MON2 N, proceed to vary the one-shot capacitance.
  The capacitors are placed on PWB UNRA-B positions C2 to C8.
  Remember to always solder the positive capacitor lead on the innermost PWB run pad (that is to say, facing the centre of the PWB).
- Precise setting of either MON1 N or MON2 N by varying the capacitors results extremely difficult therefore, to obtain a quick and exact DEM1 + MON1 N or DEM2 + MON2 N duration, pre-set a DEM1 or DEM2 time of 500/us to 2 msecs.

2) - SIC1 N, SIC2 N Timing

- Connect the scope input on the ATA 140 signal, loc. L-20-14. EXT "-" sync on L-20-3.
- Remove the PWB in loc. L-20.
- Either remove the PWB in loc. B-30 (SIC1 N) or A-12 (SIC2 N) and insert it in loc. L-20.
- With the machine in STAND-BY and the NO SKIP 1 pushbutton operated (lamp lit), depress PAPER 1 to perform a spacing.
  The revealed signal must be at level 0 for 2 secs.
- To adjust the time of SIC1 N or SIC2 N, vary the one-shot capacitance.
  The capacitors are fitted on PWB ULUN-A positions C1 to C8.
  Remember to always solder the positive capacitor lead on the innermost PWB run pad (that is to say, facing the centre of the PWB).
- Replace the PWBs in their original locations.

3) - RES1 Timing

- Connect the scope input on the signal in B-32-10.
  Sync on INT "+".

- Fit a jumper to link I-12-10 (SORI) with B-29-12 in order to obtain a ripetitive signal on the one-shot input.
- Adjust the lower pot fitted on the PWB in loc. B-32.
- Remove the jumper.

4) - LICA, TERI, R160, FISA, RERI, TUOO Timing

- Connect up the scope input on the signal that is to be checked. Sync on INT "+".
- Program some print-outs and vary the pertinent one-shot adjust pot.

5 - FINAL CHECKS

None.

ROUTINE : 4.12

NAME : ONE-SHOT TIMINGS

APPARATUS : MEM 170 for I 51-C versions :
PRT 145 (800 lpm Newspaper label)
PRT 147 (730 lpm CMC7)
PRT 148 (800 lpm Std.)
PRT 149 (1100 lpm Std.)
PRT 168 (800 lpm 160 col.)
PRT 169 (1100 lpm 160 col.)

DURATION : 1 hr.
PREREQUISITES : None

1 - NEEDED MATERIAL

- Oscilloscope
- Screwdriver, 2.5 mm blade P.N. 4355475 P

2 - PURPOSE

To obtain correct duration of the following signals :

- SILE 1 : DULE command
- DULE 1 : Read current timing
- TEO1 : DUIN command
- DUIN 1 : Inhibition current timing
- SISI 1 : DUSI command
- DUSI 1 : Write current timing
- TIBU 1 : Comparison clock
- TEO2 1 : Buffer count clock
- TEO3 1 : Buffer re-cycle clock

3 - PRELIMINARY CHECKS

None.

4 - PROCEDURE

The one-shot timings must correspond to the following table :

SIGNAL	TIME	TOL %	PWB ROW	PWB POS.	PIN	POT LOC.
SILE 1	1490 ns	± 3	A	13	01	Upper
DULE 1	1025 ns	± 3	A	12	01	Upper
TE01	1680 ns	± 3	A	9	01	Upper
DUIN 1	1475 ns	± 3	A	9	10	Lower
SISI 1	1490 ns	± 3	A	13	10	Lower
DUSI 1	1025 ns	± 3	A	12	10	Lower
TIBU 1	1800 ns	± 3	A	8	01	Upper
TE02 1	1545 ns	± 3	A	11	01	Upper
TE03 1	2065 ns	± 3	A	11	10	Lower

1) - Connect the scope input on the signal that is to be checked. Sync on INT "+".

2) - Program the print-out and vary the pertinent one-shot adjust pot.

5 - FINAL CHECKS

None.

PREVENTIVE MAINT. LOG

I 51 C

YEAR	MACHINE	TYPE and SERIAL No.

MAINTENANCE TYPE G Approx. duration 1.8 h.h/10		
FREQ.	3 months	6 months
SHIFTS	2-3	1

SCHED. DATE	EFFECT. DATE	EFFECT. DURAT.	ENGR.

Note

This maintenance Log is valid for all the I51-C printer versions.

Always consider the CMC7 - 800 - 1100 LPM printers as working on 3 shifts.

PIECE	REPL. FREQ. (hours)	SCHEDULED REPLACEMENTS					
Lamps and print modules fan filters	6 months						

DATE	NOTES

Mod. 0146

PREVENTIVE MAINT. LOG

YEAR	MACHINE	TYPE and SERIAL No.

MAINTENANCE TYPE G Approx. duration 1.8 h.h/10		
FREQ.	3 months	6 months
SHIFTS	2-3	1

SCHED. DATE	EFFECT. DATE	EFFECT. DURAT.	ENGR.

Note

This maintenance Log is valid for all the 151-C printer versions.

Always consider the CMC7 - 800 - 1100 LPM printers as working on 3 shifts.

PIECE	REPL. FREQ. (hours)	SCHEDULED REPLACEMENTS					
Lamps and print modules fan filters	6 months						

DATE	NOTES

Mod. 0146

PARTS

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SOTTOSISTEMA STAMPANTE I 51 - C

(PRT 142-143-144-145-146-147-148-149-163-166-168-169)

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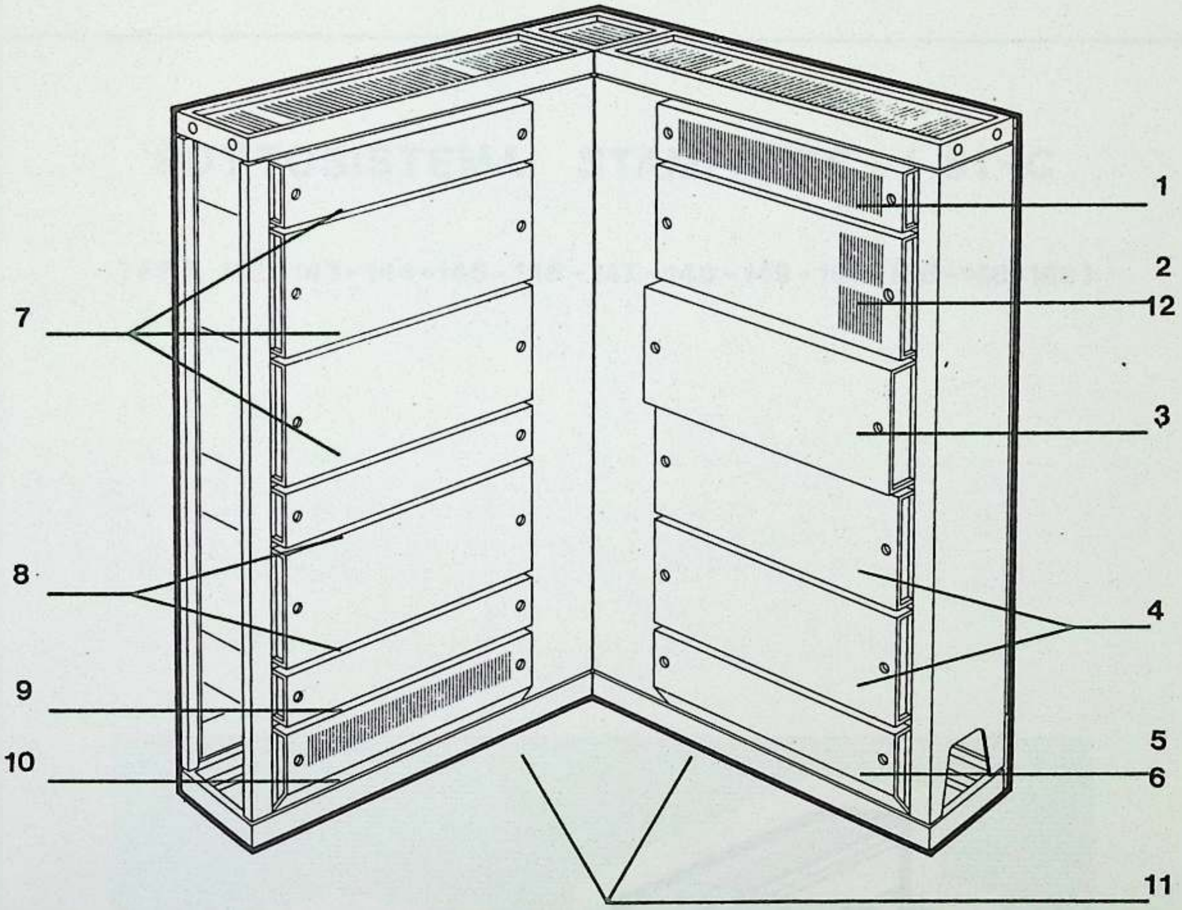

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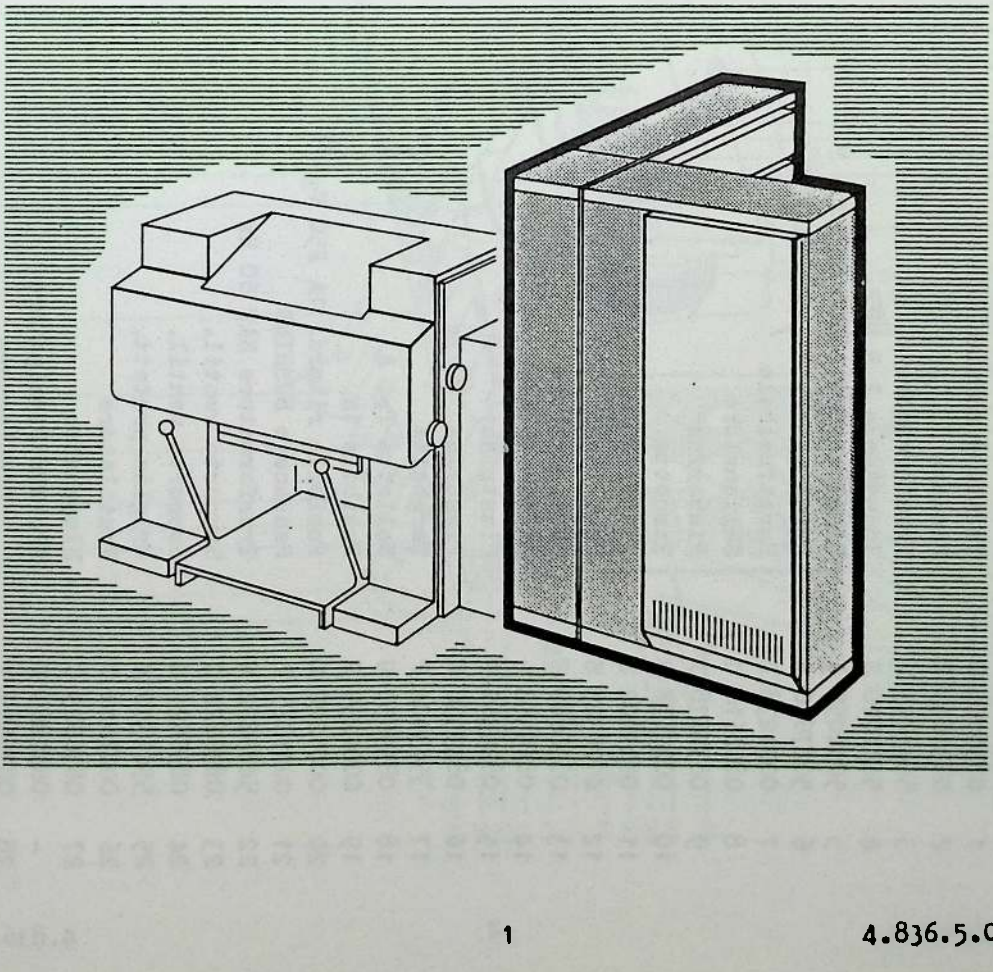
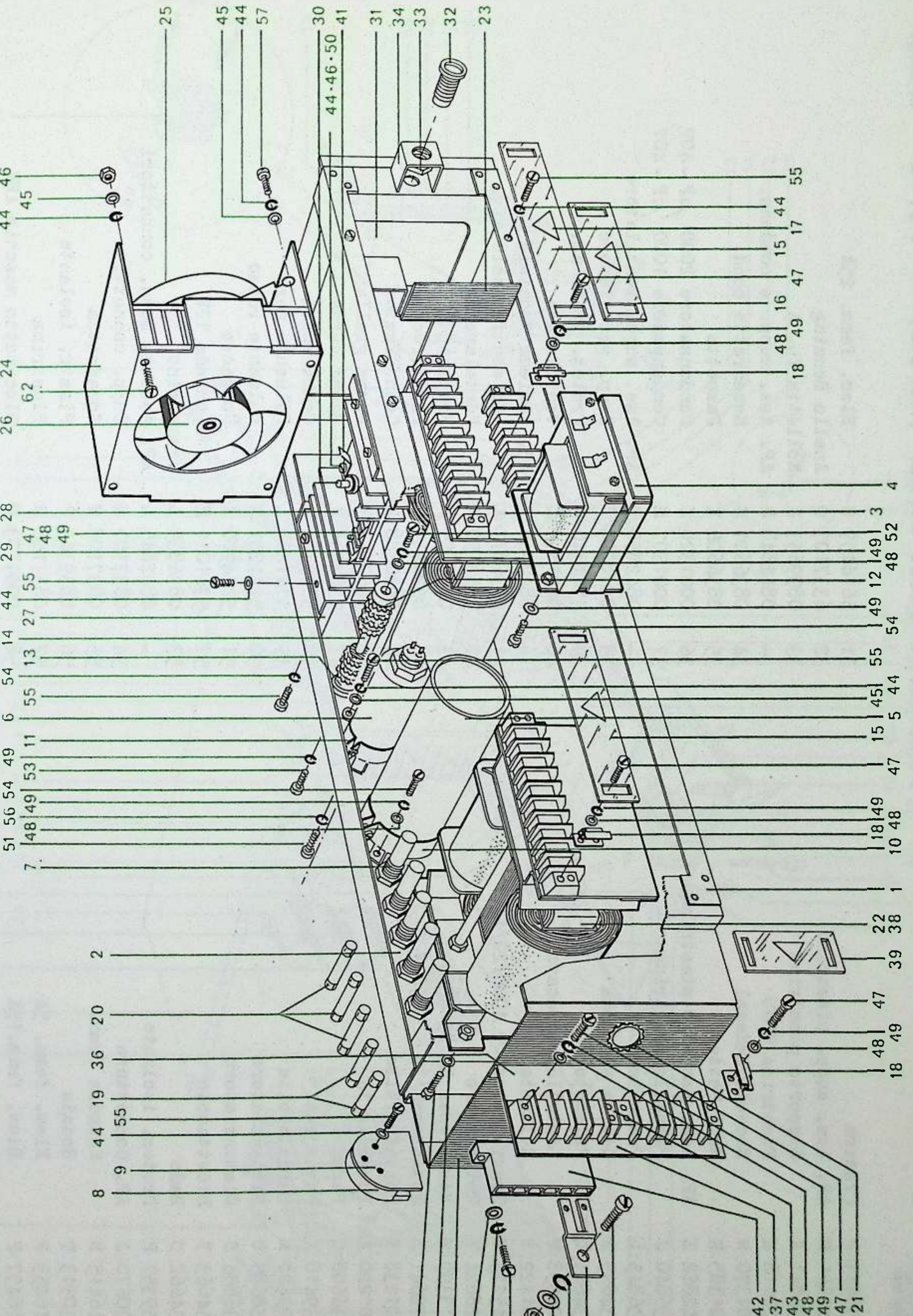
SOTTOSISTEMA STAMPANTE I 51-C

(PRT 142-143-144-145-146-147-148-149-163-166-168-169)



Complessivo tensioni secondarie (ALI 310) — I 51 - C

-	0842866 S	AG. Pannello tensioni
1	0836405 B	Telaio ½ modulo
2	0836633 D	Piastra
3	5445215 J	Trasformatore
4	5421010 S	Induttanza 2,5 mH
5	5032095 J	Condensatore 40000 uF 7,5 V
6	5027650 B	Condensatore 2 uF - 1000 V
7	0001238 X	Portafusibile
8	0842616 G	Sezionatore
9	0837678 T	Piastrina
10	0002138 H	Fascetta
11	0001402 S	Fascetta
12	4970325 S	Resistenza 0,22 12 W
13	0838685 U	Distanziatore
14	0819368 B	Distanziatore
15	0839361 F	Piastrina
16	0839356 K	Piastrina
17	3543104 P	Targhetta
18	0839653 U	Molletta Tp. A
19	0001259 V	Fusibile 1A
20	0001220 X	Fusibile ritard. 1A 250 V
21	0001875 T	Passacavo BUSHING
22	5445222 W	Trasformatore SAT 60 Hz
23	0836622 G	Supporto ventil.
24	0836621 U	Supporto ventil.
25	5541340 N	Griglia protett.
26	0001614 C	Ventilatore
27	0836623 C	Blocchetto
-	0842863 V	AP. MTH Dissipatore
28	0836619 V	Dissipatore
29	0842859 N	Gruppo terminali
30	0000788 H	Diodo 4A - F2N
31	0674215 K	Schermo cater.
32	0834663 Y	Boccola
33	0834662 U	Dado
34	0839420 L	Squadretta
-	0842867 W	AP. Assieme morsett.
35	0836667 U	Supporto
36	0836630 W	Supporto morsett.
37	0836629 S	Piastrina
38	5445220 R	Trasformatore SAT 50 Hz
39	0839355 F	Piastrina isolante
40	0836626 H	Cavallotto
41	0836617 C	Terminale
42	0830388 L	Connettore Faston
43	0001798 P	Morsettiera
44	6332103 N	Rondella elastica Ø 3,2
45	6331103 A	Rondella piana Ø 3,2
46	6321103 H	Dado M3
47	6311245 K	Vite TC 4x15
48	6331104 X	Rondella piana Ø 4,3
49	6332104 B	Rondella elast.Ø 4,3
50	6311232 V	Vite TC 3x10
51	6311256 Y	Vite TC 5x10
52	6311249 L	Vite TC 4x30
53	6311244 P	Vite TC 4x12
54	6311242 W	Vite TC 4x8
55	6311231 R	Vite TC 3x8
56	6332105 F	Rondella elastica Ø 5.3
57	6311234 N	Vite TC 3x15
58	0680614 A	Vite TC 8x15
59	0682560 L	Rondella piana Ø 8.4
60	0683131 E	Rondella elast.Ø 8.4
61	0682481 G	Dado M8
62	6312736 L	Vite TS 3x15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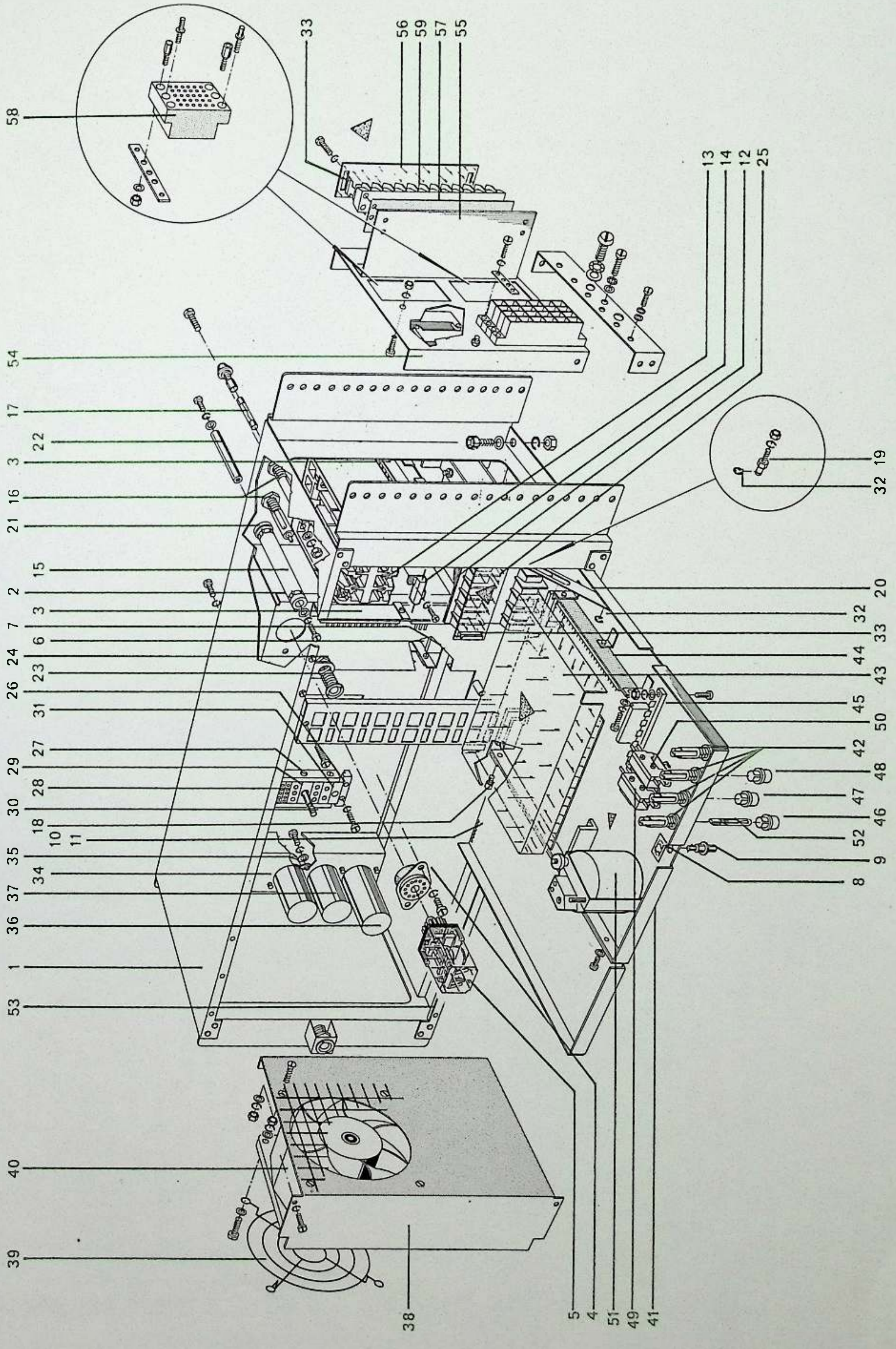
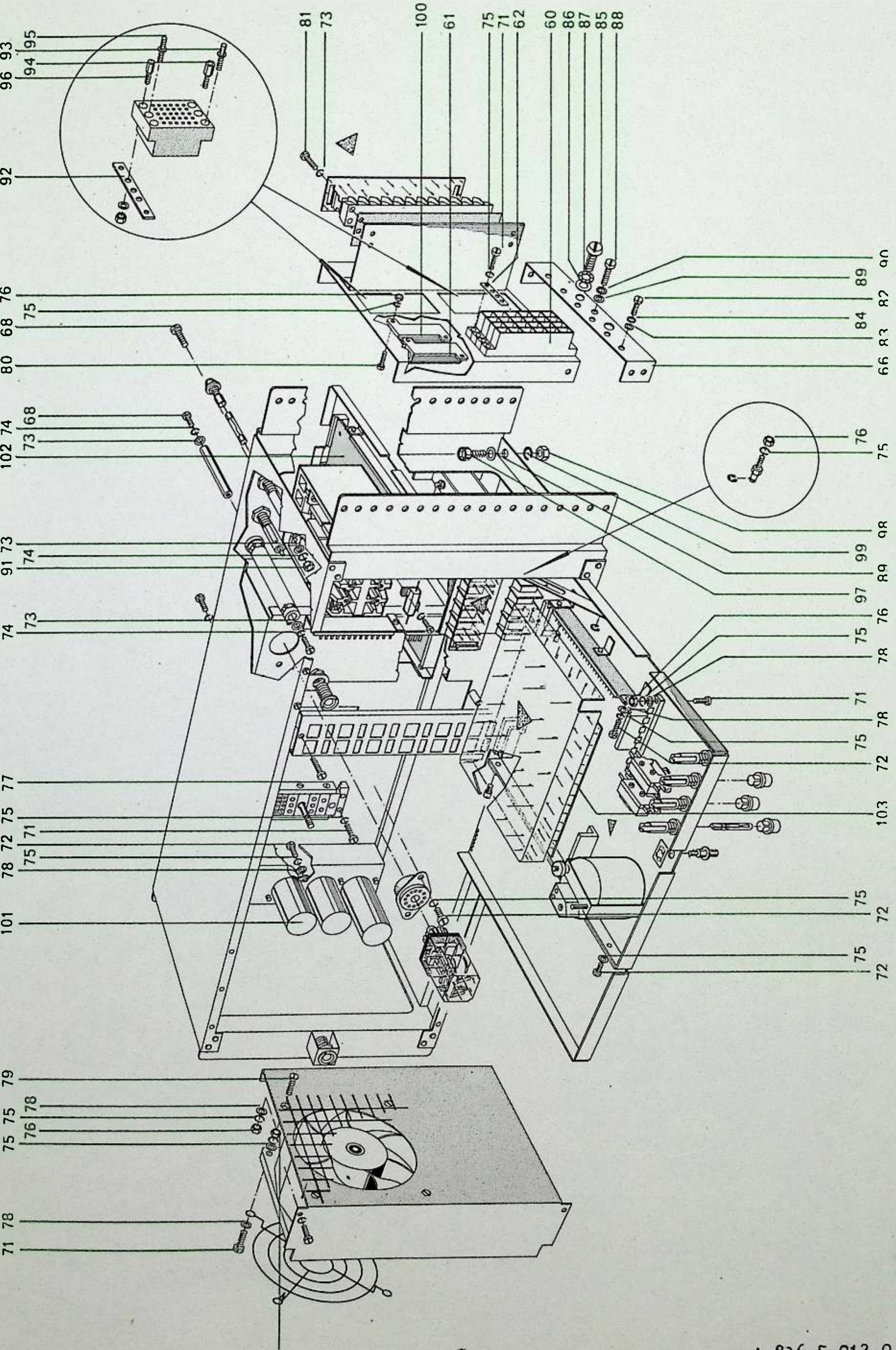
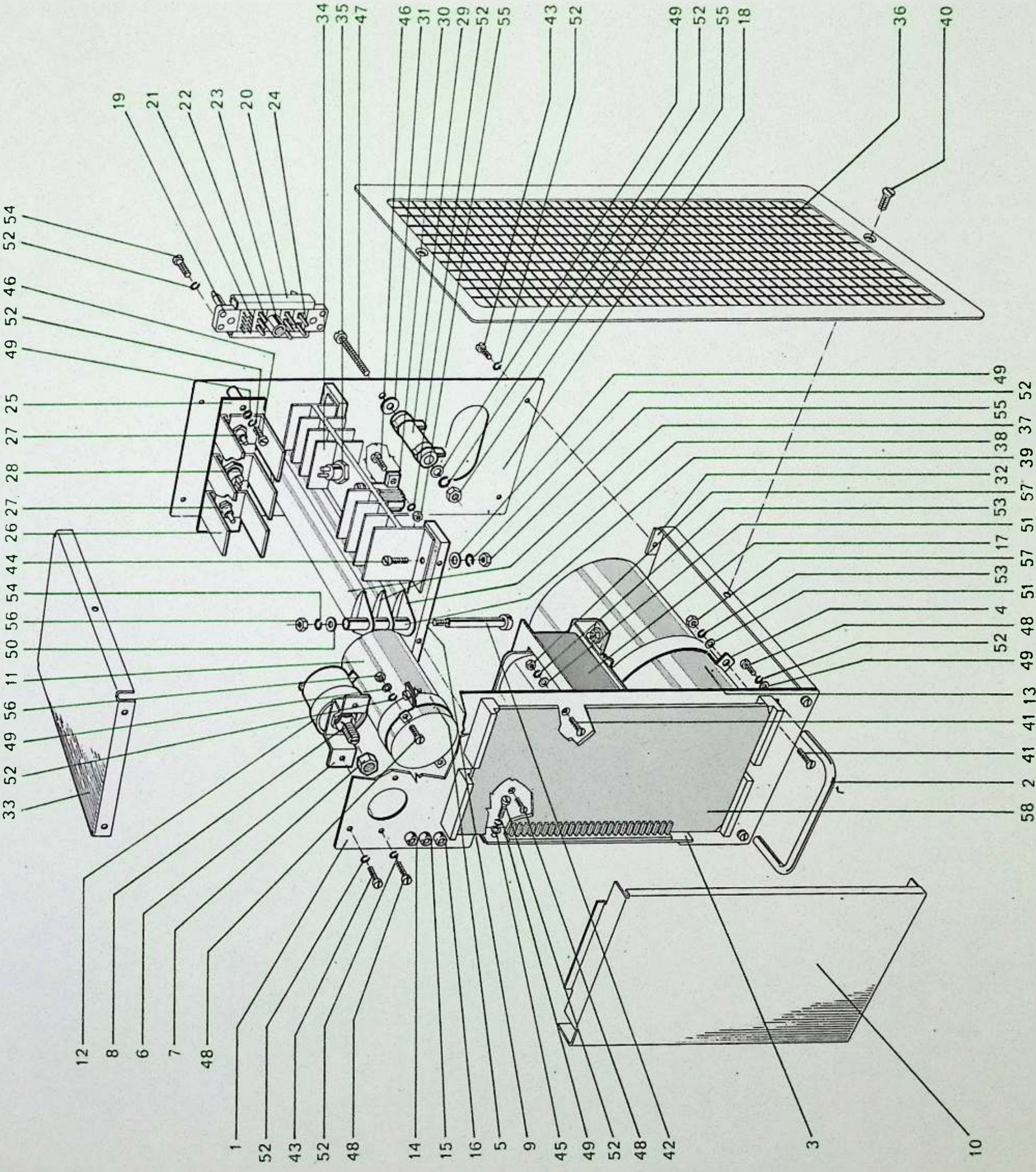
1	0836613	B	Piastra
-	0842861	M	AP. Ass. supp. piastrine
2	0836841	K	Supporto piastrine
3	0620118	K	Piastrina COSU
4	0001370	W	Zoccolo Undecal
5	0001385	H	Relé Potter
-	0842862	Z	AP. Ass. pannello piastrina
6	0836840	J	Pannello piastrina
7	0836845	L	Protezione
8	0834665	R	Staffa elastica
9	0834661	Q	Pulsante
10	0001858	W	Listello passacavo
11	0001422	B	Collante
12	5445225	K	Trasformatore T 4000/22/14
13	5326624	X	Teleruttore
14	4973399	W	Resistenza RH 25 220
15	4972641	Z	Resistenza 39 50 W
16	0001238	X	Portafusibile
17	0001220	X	Fusibile 1A
18	0836608	C	Perno
19	0839418	J	Perno sup.
20	0839421	M	Guida mobile
21	0838685	U	Distanziatore
22	0836833	S	Distanziatore
23	0834663	Y	Ricettacolo
24	0834662	U	Dado
25	0839357	P	Protez. isolante
-	0830670	J	AP. Connettore
26	5616415	B	Squadra femm.
27	0830513	T	Rotaia
28	5616455	F	Elem. femm. 5A
29	5616457	P	Elem. femm.15A
30	0830514	Q	Estrattore
31	5616459	G	Elem. femm. 25A
32	6337107	Q	Anello Benzing
33	0899653	U	Molletta Tp. A
-	0842848	R	AP. Ass. supp. e condens.
34	0836601	E	Squadretta cond.
35	0836606	K	Fascetta
36	0001320	Z	Condensatore 2000 µF - 40V
37	0001307	M	Condensatore 1000 µF - 40V
-	0842850	K	AP. Ass. supp. ventilatore
38	0818294	P	Supp. ventilatore
39	5541340	N	Protez. ventilat.
40	0001614	C	Ventilatore
-	0842962	T	AP. Assieme frontale
41	0836877	X	Assieme frontale riv.
42	5363150	R	Portalampada
43	0836869	P	Protezione
44	0620233	Z	Piastr. cose
45	0830388	L	Conn. Faston
46	5363153	S	Gemma gialla
47	5363154	P	Gemma verde
48	5363152	W	Gemma rossa
49	5141200	L	Pulsante nero
50	5141201	M	Pulsante rosso
51	5254900	K	Contaore
52	5361011	M	Lampada 12V
53	0836839	L	Traversino
-	0842845	L	AP. Assieme supp. connettori
54	0837107	H	Supp. connett.
55	0837108	W	Squadretta
56	0839363	P	Piastr. isolante
57	0837106	D	Piastrina
58	0001703	U	Blocchetto maschio AMP
59	0001693	X	Morsettiera K 612/A



60	0830388 L	Connettore Faston
61	4973170 M	Resistenza 120 50 W
62	0839261 D	Barra fissaggio conn.
63	0836605 F	Supporto ricettacolo
64	0833359 N	Perno
65	0836634 S	Tappo
66	0836879 Q	Gr. ancoraggio masse
67	6311247 T	Vite TC 4x20
68	0836400 N	Telaio alim. 1M
69	6311231 R	Vite TC 3x8
70	6311244 P	Vite TC 4x12
71	6311234 N	Vite TC 3x15
72	6311230 Q	Vite TC 3x6
73	6331104 X	Rondella piana ø 4,3
74	6332104 B	Rondella elast.ø 4,3
75	6332103 N	Rondella elast.ø 3,2
76	6321103 H	Dado M3
77	6312732 K	Vite TS 3x6
78	6331103 A	Rondella piana ø 3,2
79	6312736 L	Vite TS 3x15
80	6311232 V	Vite TC 3x10
81	6311245 K	Vite TC 4x15
82	0680239 Z	Vite TC 3x15
83	0682454 P	Rondella piana ø 3,2
84	0683066 V	Rondella dent. ø 3,2
85	0680614 A	Vite TC 8x15
86	0682560 L	Rond. piana ø 8,4
87	0683131 E	Rond. dent. ø 8,4
88	0680597 V	Vite TC 5x15
89	0682557 V	Rond. piana ø 5,3
90	0683092 F	Rond. dent. ø 5,3
91	6221104 W	Dado M4
92	0838039 M	Barretta di fissaggio
93	0001102 L	Guida d'angolo maschio
94	0001124 T	Femmina di accoppiamento
95	0001123 E	Maschio di accoppiamento
96	0001103 Q	Guida d'angolo femmina
97	6313132 B	Vite TCCE M5x15
98	6321105 S	Dado M5
99	6332105 F	Rondella elastica ø 5,3
100	4972940 P	Resist. 75 50 W (C.O. 100143)
101	5038570 Z	Cond. 3000 MF 30V (C.O. 100742)
102	0620119 P	PST SUTE
103	0620117 W	PST FRIZ



-	0842852 Y	AP. Assieme frontale
1	0837109 S	Telaio frontale
2	0837519 X	Maniglia
3	0620116 S	Piastra COAM
4	0002138 X	Fascetta
5	0001402 S	Fascetta
6	0837114 J	Omega
7	4999530 V	Dado lesa
8	4999550 X	Boccola lesa
9	0837113 V	Traversino
10	0836615 U	Protezione
11	5048088 H	Cond. 220 µF 200V
12	4995204 V	Reost 62 25 W
13	5045649 X	Cond. 9100 µF 100 V
14	5610024 T	Boccola nera
15	0001299 H	Boccola verde
16	5610021 W	Boccola rossa
17	5421014 Y	Indutt 6 mH
18	0837111 M	Piastra posteriore
-	0830671 K	AP. Connettore
19	5616413 J	Guida maschio
20	0830513 T	Rotaia
21	5616450 D	Elem. maschio 5 A
22	5616452 T	Elem. maschio 15 A
23	5616418 G	Estratt. Femm.
24	5616454 B	Elem. maschio 25 A
-	0842847 U	AP. Ass. piastrina diodi
25	0837116 S	Piastrina
26	0837117 W	Dissipatore
27	0001375 Y	Diodo TP 367 D
28	0000729 B	Diodo TP 10 RC 20
29	4974634 N	Res. seci 3,9 K 10W
30	4971020 P	Res. RH 50 50 m
31	0001506 V	Rond. isolante
32	0836602 J	Testata inf.
33	0836607 P	Testata super
-	0842849 M	AP. Ass. dissipatore
34	0838136 R	Dissipatore
35	0001710 G	Diodo SCR 2 N 683
36	0837118 K	Ass. protezione
37	4973507 L	Resist. 300 r.p.v.
38	4971862 Q	Resist. 6,2 r.p.v.
39	0001569 C	Supp. resist.
40	6312732 K	Vite T.S. 3x6
41	6312744 D	Vite T.S. 4x10
42	6312733 P	Vite T.S. 3 x 8
43	6311230 Q	Vite T.C. 3 x 6
44	6311234 N	Vite T.C. 3 x 15
45	6311266 Z	Vite T.C. 5 x 50
46	6311232 V	Vite T.C. 3 x 10
47	0680338 X	Vite T.C. 3 x 45
48	6311231 R	Vite T.C. 3 x 8
49	6331103 A	Rond. piana ø 3,2
50	6331105 T	Rond. piana ø 5,3
51	6331104 X	Rond. piana ø 4,3
52	6332103 N	Rond. elas. ø 3,2
53	6332104 B	Rond. elas. ø 4,3
54	6332105 F	Rond. elas. ø 5,3
55	6321103 H	Dado M 3
56	6321105 S	Dado M 5
57	6321104 W	Dado M 4
58	0620142 U	PST FREF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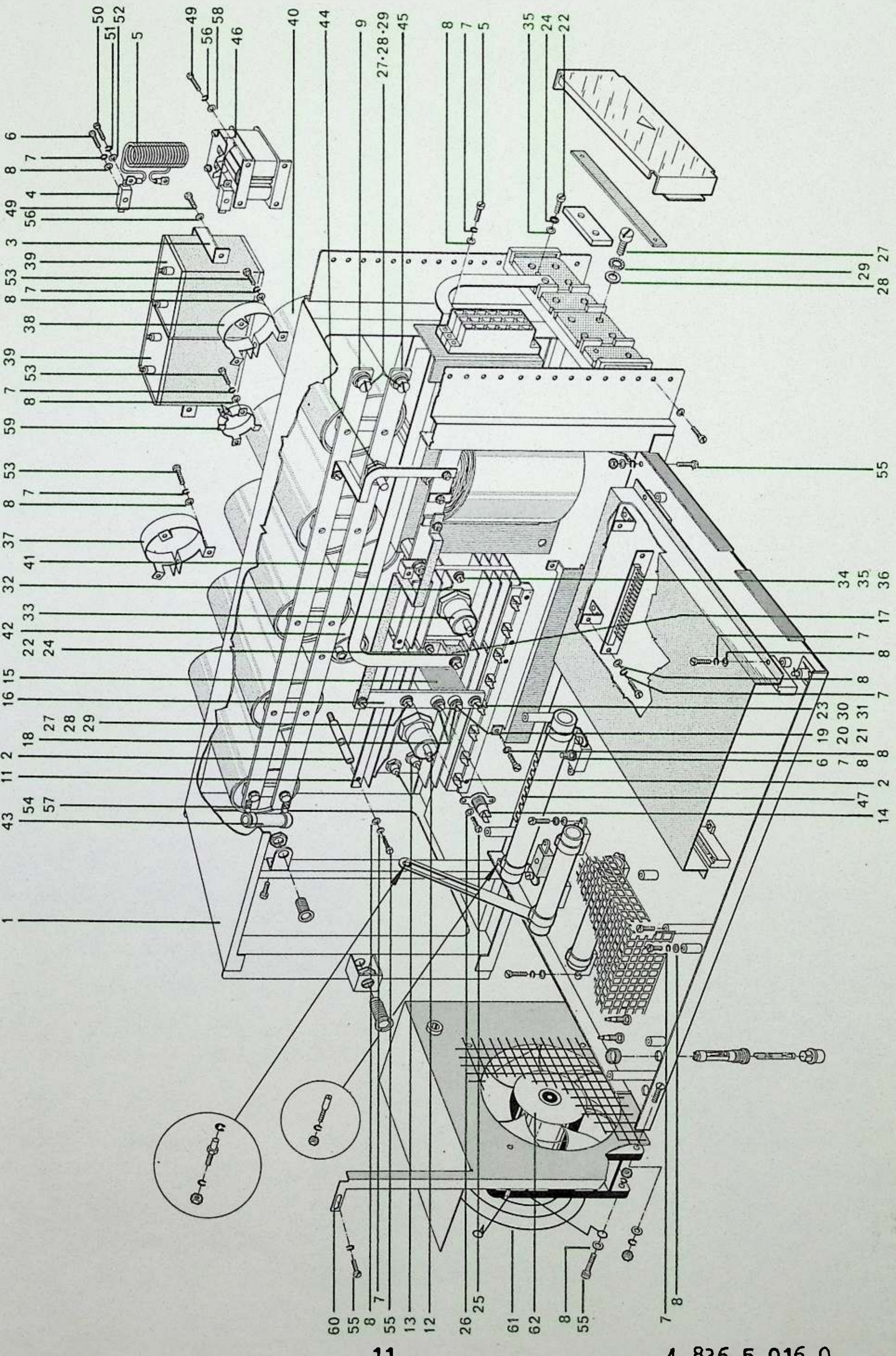
-	0818277	R	AG. Assieme piastra
1	0818278	E	Gruppo piastra
2	0838137	M	Distanziale Tp. 1
3	0836663	G	Gruppo Omega
4	0837679	K	Supporto
5	0836652	B	Bobina
6	6311236	W	Vite TC M3x20
7	6332103	N	Rondella elastica ø 3,2
8	6331103	A	Rondella piana ø 3,2
9	0836693	K	Barra cond.
10	3543104	P	Targhetta
-	0842877	X	AP. Mtg. dissipatore
11	0836665	Z	Dissipatore
12	0842874	K	Diodo
13	5812010	W	Diodo 1N 1200 A
14	5441302	W	Termoswitch Klixson
15	0836657	G	Blocchetto
16	0836695	C	Barra di ancoraggio
17	0836811	Q	Squadretta ancoraggio
18	0834229	E	Boccola
19	0680575	A	Vite TC M4x45
20	6331104	X	Rondella piana ø 4,3
21	6332104	B	Rondella elast.ø 4,3
22	0680550	E	Vite TC M4x15 ott.
23	0680591	S	Vite TC M5x15 ott.
24	0683086	F	Rondella dentell. ø 4,3
25	0680135	W	Vite TC 2,6MAx8
26	0683040	M	Rondella elast. ø 2,8
27	0680614	A	Vite TC M8x15
28	0682560	L	Rond. piana ø 8,4 ott.
29	0683131	E	Rond. dent. ø 8,4
30	0682557	Y	Rond. piana ø 5,3 ott.
31	0683092	F	Rond. dent. ø

-	0842876	T	AP. Mtg. Dissipatore
32	0836664	V	Dissipatore
33	0842875	P	Diodo
34	0680550	E	Vite TC M4x15 ott.
35	0682456	X	Rond. piana ø 4.3
36	0683086	F	Rond. dent. ø 4.3
37	5091062	L	Fascetta 1264 Z
38	0001402	S	Fascetta 1420 Z
39	5048099	D	Cond. 250 /uF 160V
40	5048822	U	Cond. 22000 /uF 75V
41	5048295	Y	Cond. 980 /uF 200V
42	5048260	K	Cond. 600 /uF 150V
43	4973870	K	Res. 680 /15 W
44	5812025	Z	Diodo 26G20
45	0836692	P	Barra condens.
46	5092250	E	Ind. 50 mH
47	0001875	T	Lista passacavo
48	0842873	W	Barra Faston
49	6311242	W	Vite TC M4x8
50	0680506	T	Vite TC M4x8 ott.
51	0683086	F	Rond. dent. ø 4,3
52	0682456	X	Rond. piana ø 4.3
53	6311231	R	Vite TC M3x6
54	0680135	W	Vite TC 2,6MAx8 ott.
55	6311234	N	Vite TC M3x15
56	6332104	B	Rond. elast. ø 4,3
57	0683040	M	Rond. elast. ø 2,8
58	6331104	X	Rond. piana ø 4.3
59	0003128	H	Fascetta
-	0842878	L	AP. Ass. Supp. ventil.
60	0836667	H	Telaio supp. vent.
61	5541340	N	Griglia prot.
62	0001614	C	Vent. Rotron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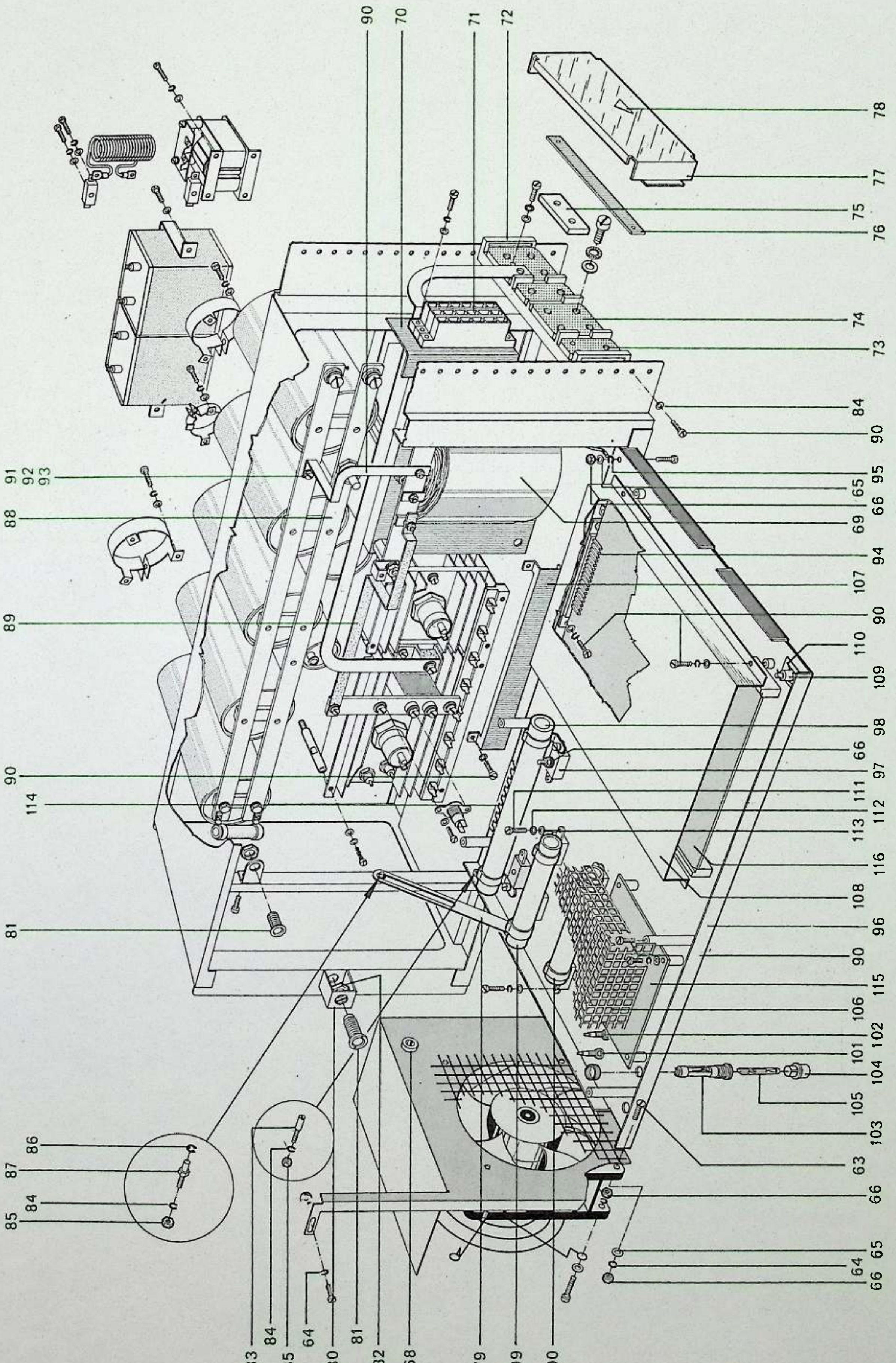
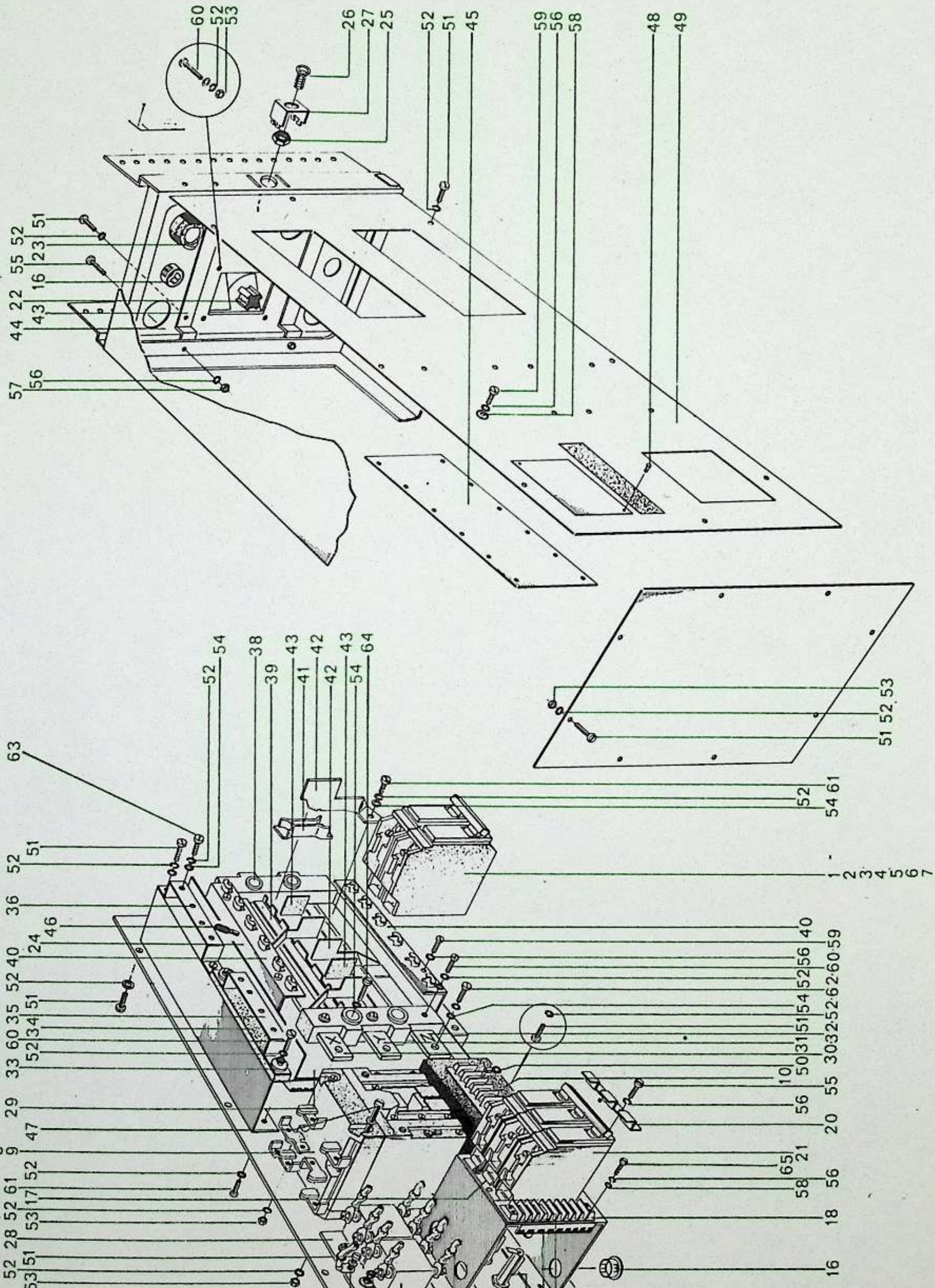
63	6312736 L	Vite TS M3x15
64	6332103 N	Rond. elast. Ø 3,2
65	6331103 A	Rond. piana Ø 3,2
66	6321103 H	Dado esag. M3
67	0831075 J	Targhetta
68	0001876 F	Passacavo
69	5092100 J	Indutt. 0,35 mH 50A
70	0836603 N	Supp. Faston
71	0830388 L	Conn. Faston
–	0818080 N	AP. Ass. morsettiera
72	0819179 C	Supporto barrette
73	0836675 S	Barretta Tp. 1
74	0836676 E	Barretta Tp. 2
75	0836625 V	Ponticello
76	0836674 W	Targhetta
77	0836672 D	Protezione
78	3543104 P	Targhetta
79	0839421 M	Guida mobile
80	0839420 L	Squadretta
81	0834663 Y	Boccola
82	0834662 U	Dado
83	0833359 N	Perno
84	6332103 N	Rond. elastica Ø 3,2
85	6321103 H	Dado esagonale M3
86	6337106 Q	Anello benzina Ø 3,5
87	0839418 J	Perno superiore
88	0836872 S	Barra Tp. 1
89	0836873 W	Barra Tp. 2
90	0836874 K	Barra Tp. 3
91	0680591 S	Vite T.C. M5 x 15 OT
92	0682557 Y	Rond. piana Ø 5,3 OT
93	0683092 F	Rond. elast. Ø 5,3
94	0836882 B	Protezione
95	0800831 M	Cavetto di massa
–	0842879 Q	AG.Ass. frontale
96	0836669 S	Gr. frontale
97	0836653 F	Supporto
98	4972110 K	Res. 8,2 110 W
99	4972320 Q	Res. 18 60 W
100	4970322 Q	Res. 0,22 50 W
101	5610024 T	Boccola PUP R708 nera
102	5610021 W	Boccola PUP R708 rossa
103	5363150 R	Portalampada RAFI
104	5363154 P	Gemma RAFI
105	5575094 G	Lampada 60 V
106	0836819 J	Protezione
107	0842967 Y	Mtg. piastrina
108	0836654 U	Protezione piastrina
109	0834661 Q	Pulsante FASTNER
110	0834665 R	Staffa FASTNER
111	0680205 H	Vite T.C. M3 x 8 OT
112	0683060 P	Rond. Dent. Ø 3.2
113	0682454 P	Rond. piana Ø 3.2
114	0001422 Q	Collante 3 MEC 847
115	0620146 W	PST ALCI
116	0620145 R	PST LOCO



1	0001357 E	Breaker unipolare 10 A
2	0001474 E	Breaker bipolare 10 A
3	0001519 F	Breaker bipolare 15 A
4	0002114 E	Breaker tripolare 10 A
5	0001356 A	Breaker tripolare 15 A
6	0002115 A	Breaker tripolare 20 A
7	0001518 B	Breaker tripolare 30 A
8	0001885 C	Contattore 24V - 50 Hz
9	0001884 G	Contattore 24V - 60 Hz
10	0001315 S	Trasformatore AROS
11	0001449 G	Filtro ICAR
12	0001238 X	Portafusibile Littelfuse
13	0001244 X	Fusibile 3A
14	0001218 V	Fusibile 0,5A
15	5618320 N	Passacavo Wechesser
16	0001875 T	Passacavo Bushing
17	0839624 N	Aggancio mobile
18	0838666 W	Piastrina numerata
19	5612455 E	Morsettiera Rhodex
20	0839622 V	Aggancio fisso
21	0001355 W	Breaker TQC 3430
22	0001354 S	Spina INLET
23	0001373 F	Passacavo Bushing
24	0839615 R	Supporto barra
-	0835484 X	AG. Supporto fissaggio coperchio
25	0834662 U	Dado fastener
26	0834663 Y	Ricettacolo Fastener
27	0835132 C	Supporto
28	0839625 J	Piastra sotto filtro
29	0839621 R	Piastra isolante
30	0839616 Y	Barra di contatto tipo X
31	0839620 Q	Barra di contatto tipo Y
32	0839618 N	Barra di contatto tipo Z
33	0838987 T	Boccola isolante
34	0838988 Q	Piastrina isolante
35	0838986 X	Morsettiera neutro
36	0838985 K	Morsettiera terra
37	5613520 F	Capocorda
38	0001788 N	Supporto Blok
39	0838669 K	Isolante centrale
40	0001883 K	Aggancio breaker
41	0001791 R	Insulator
42	0001787 Z	Outer Phase
43	0838670 R	Sostegno piastra connettori
44	0839634 P	Fiastra connettori
45	0839627 S	Scorrevole
46	5613328 S	Capocorda
47	0839626 W	Vite contattore
48	1925110 E	Chiodo autofilettante
49	0839637 T	Piastra frontale
50	5613520 F	Capocorda
51	6311243 S	Vite TC 4MAx10
52	6332304 F	Rondella dentellata Ø 4,3
53	6321104 W	Dado 4MA
54	0682456 Y	Rondella piana ott.nich. Ø 4 3
55	6311232 V	Vite TC 3MAx10
56	6332303 J	Rondella dentellata Ø 3 2
57	6321103 H	Dado 3MA
58	6331103 A	Rondella piana Ø 3,2
59	6311231 R	Vite TC 3MAx8
60	6311245 K	Vite TC 4MAx15
61	6311242 W	Vite TC 4MAx8
62	0680506 T	Vite TC 4MAx8 ott.nich.
63	0680540 D	Vite TC 4MAx12 ott.nich.
64	6311247 T	Vite TC 4MAx20
65	6311234 N	Vite TC 3MAx15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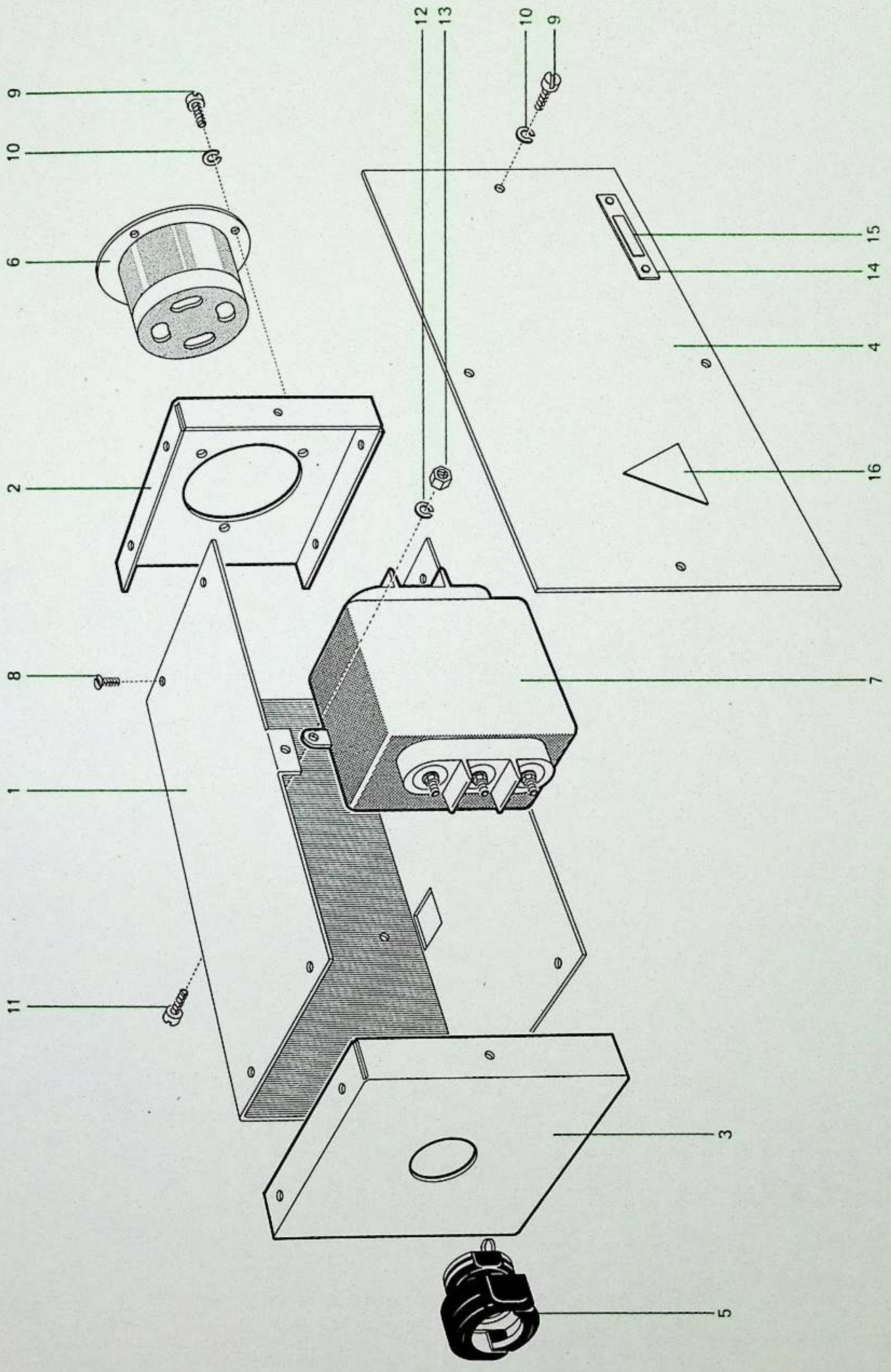
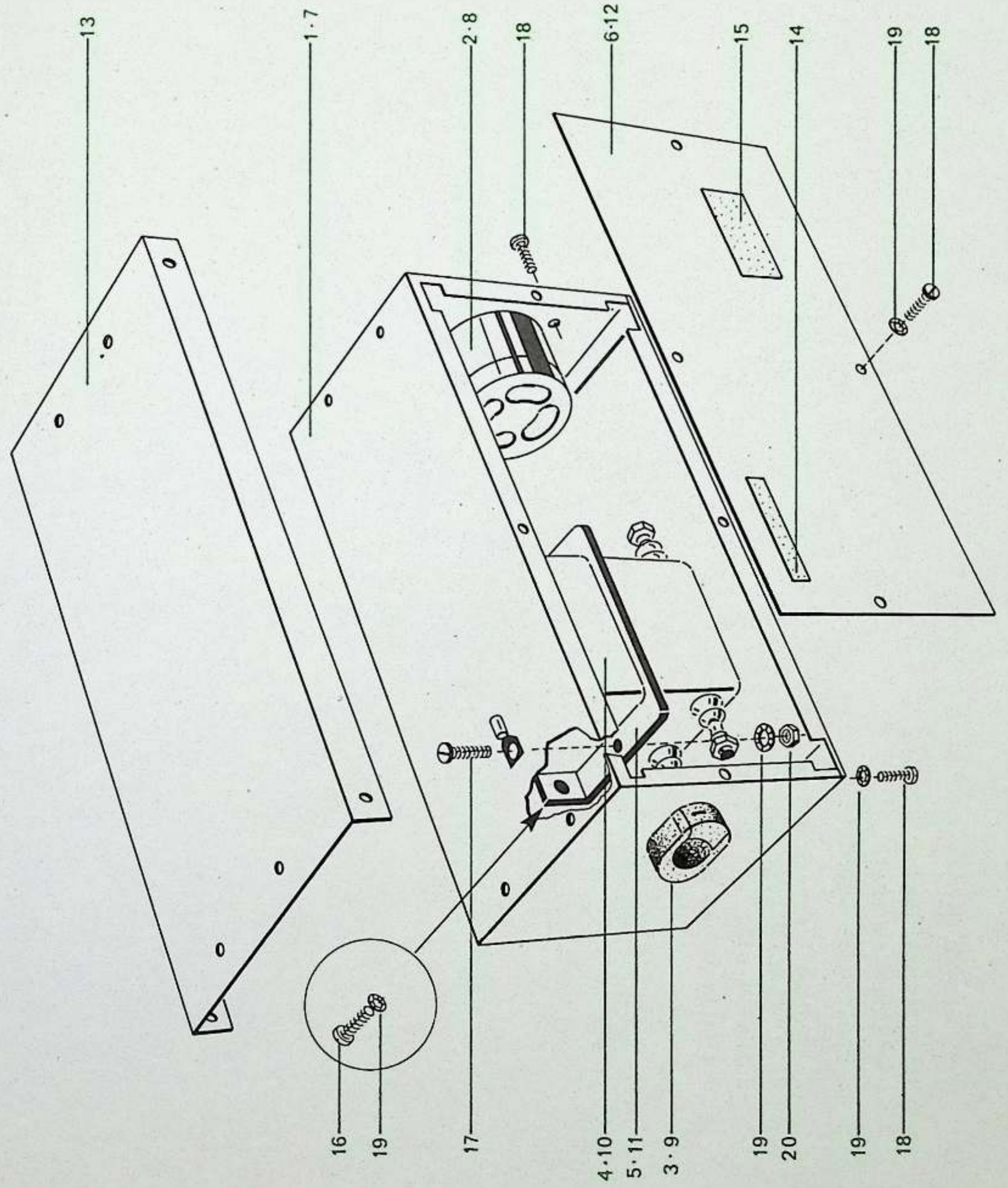
–	0643394	H	AG. ALI 290
1	0819152	L	Fondo
2	0837774	U	Testata DX
3	0837773	F	Testata SX
4	0839165	C	Coperchio
5	0001373	F	Passacavo
6	0001292	K	Connettore
7	5427068	F	Filtro
8	6312733	P	Vite TS 3x8
9	6311243	S	Vite TC 4x10
10	6332104	B	Rondella Elast. Ø 4,3
11	0680534	D	Vite TC 4x10 ottone
12	0683081	S	Rondella elastica Ø 4,3 B8
13	0682260	E	Dado M4 ottone
14	0834397	W	Targhetta U.E.
15	0834416	U	Etichetta codice
16	3543106	X	Targhetta



-	0645810 P	AG. ALI 290 mod.A Filtro trifase senza neutro
1	0839164 G	Scatola
2	0001292 K	Entrata
3	0001373 F	Passacavo
4	5427060 F	Filtro RF ICAR
5	0839167 L	Sostegno filtri
6	0839165 C	Coperchio scatola
-	0645811 Q	AG. ALI 290 mod. B -Filtro trifase con neutro
7	0838819 B	Scatola
8	0001383 Q	Entrata
9	0001373 F	Passacavo
10	5427060 F	Filtro RF ICAR
11	0839167 L	Sostegno filtri
12	0838820 H	Coperchio scatola
13	0838499 S	Supporto ALI 290
14	0834416 U	Targhetta I.C.
15	0831766 S	Etichetta autoadesiva
16	6311242 W	Vite TC 4MAx8
17	6311245 K	Vite TC 4MA x 15
18	6311243 S	Vite TC 4MA x 10
19	6332304 F	Rondella dentellata ∅ 4,3
20	6321104 W	Dado 4MA


1·7
2·8
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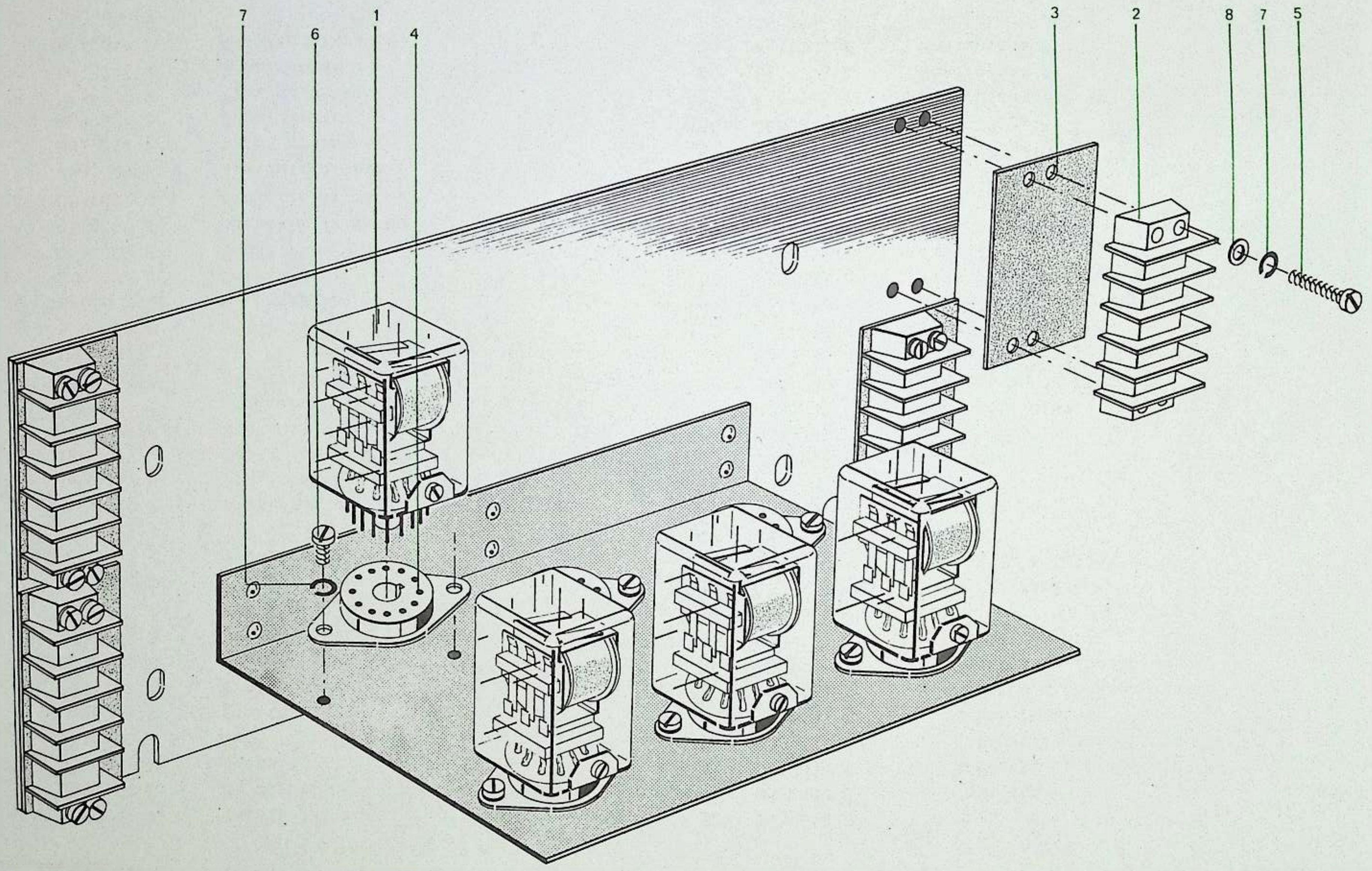
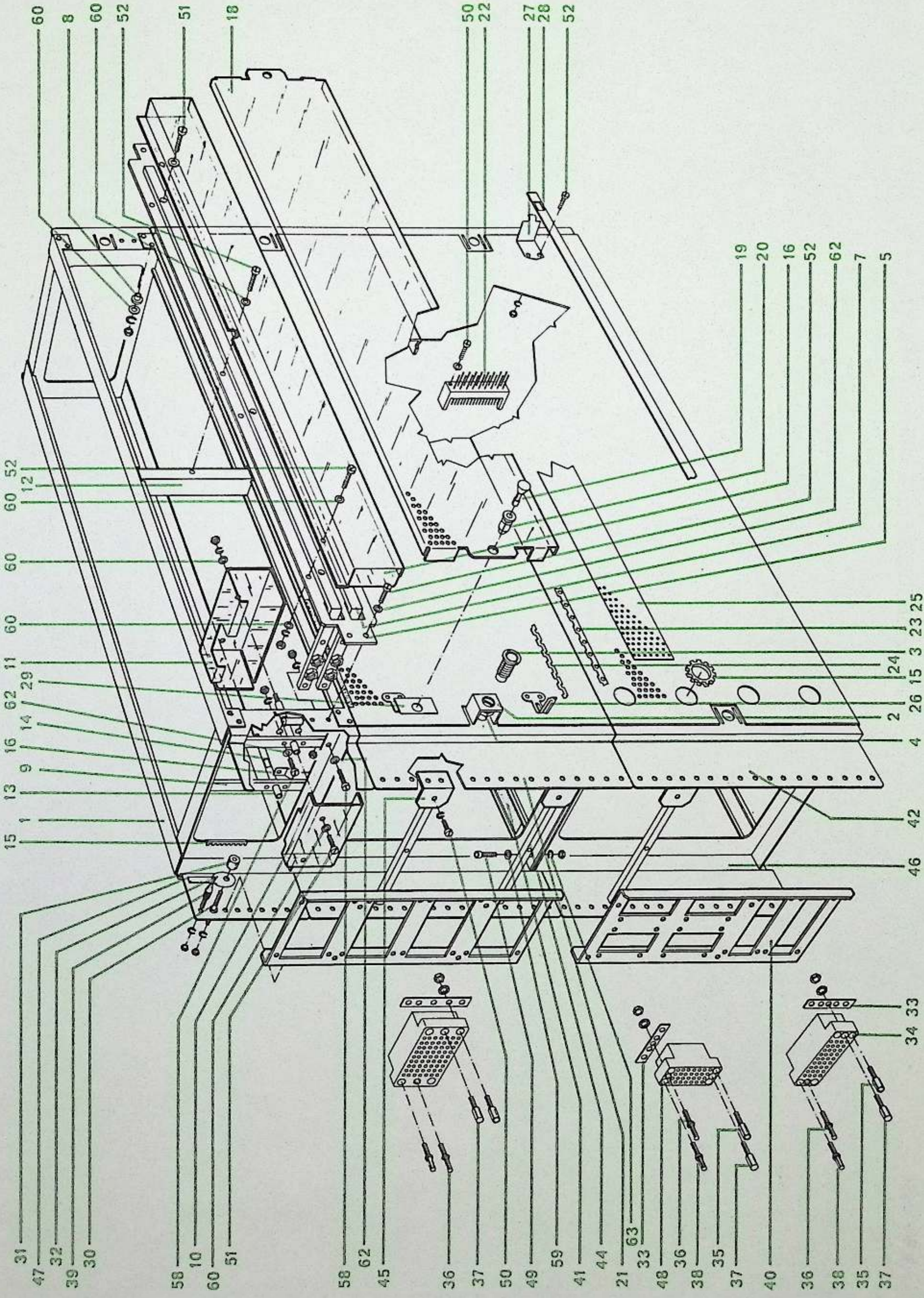
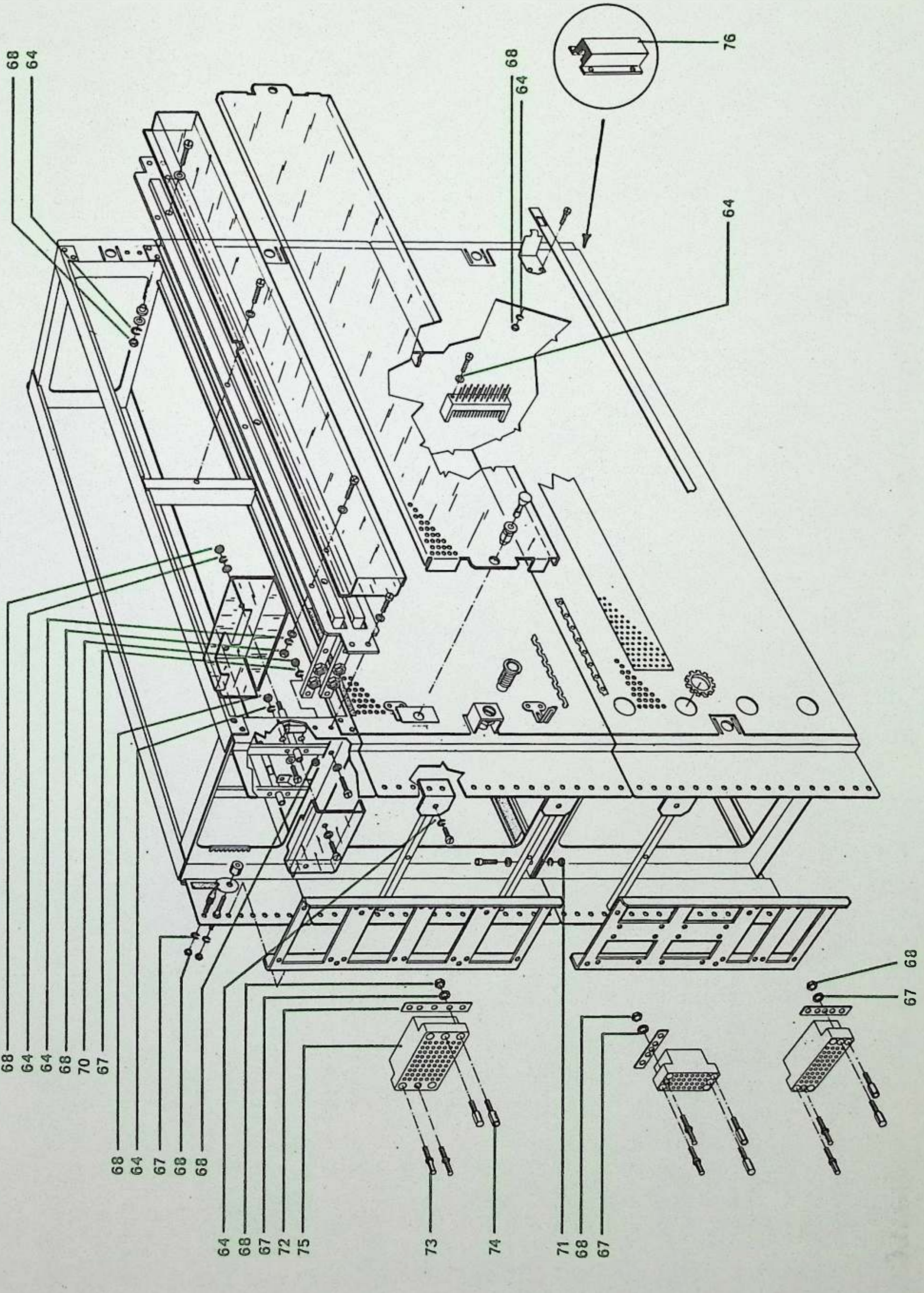
-	0646519 F	AG.	VAR 591
1	5306510 G		Relé Potter KAP 14AY
2	5612430 C		Morsettiera Rhodex K 505/A
3	5612994 H		Piastrina numerata
4	0001370 W		Zoccolo Relé UNDECAL
5	6311244 P		Vite TC M4x12
6	6311242 W		Vite TC M4x8
7	6332104 B		Rondella elastica Ø 4,3
8	6331104 X		Rondella piana Ø 4,3



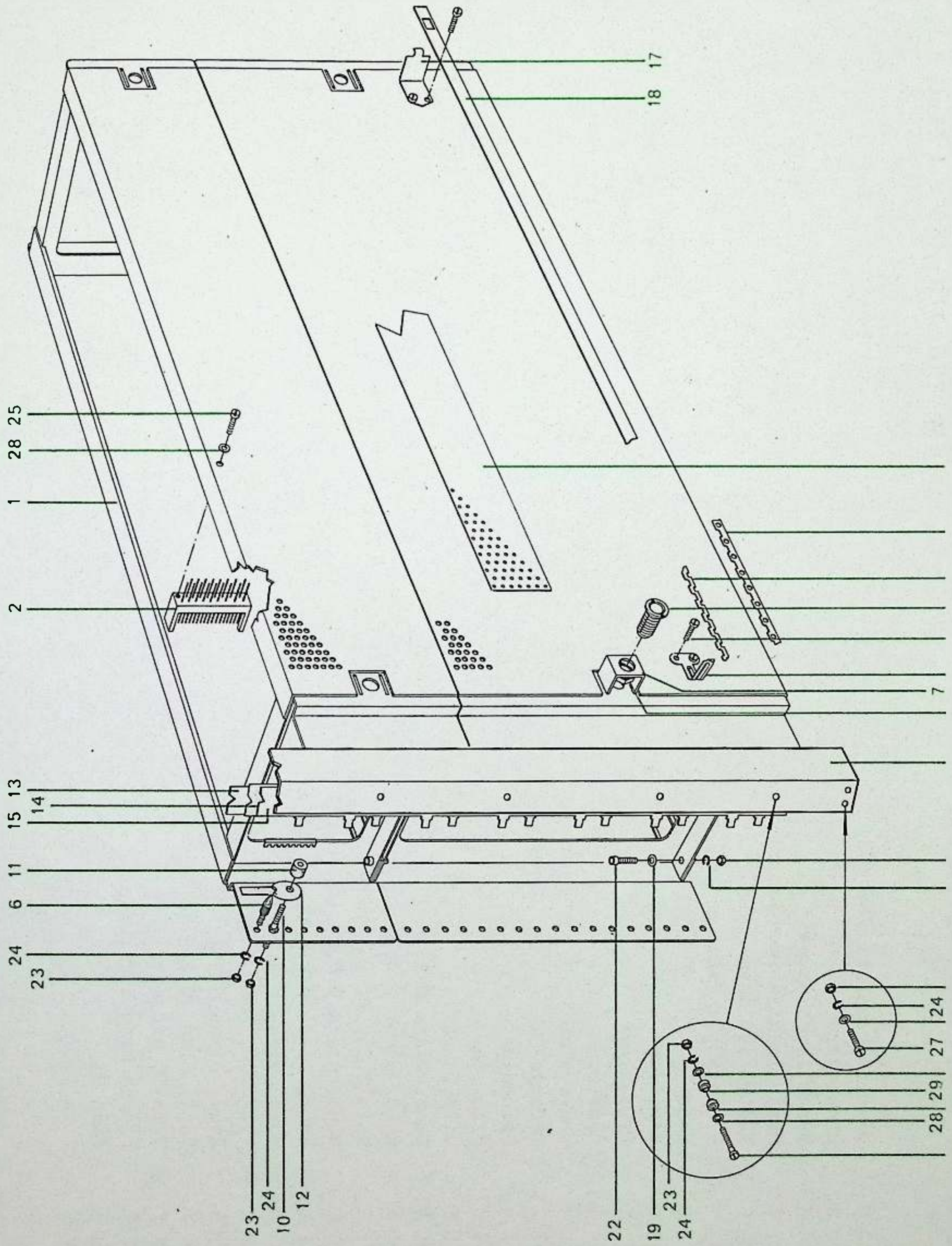
1	0840093	V	Telaio 1/2 mod
2	0839420	L	Squadretta
3	0834663	Y	Boccola
4	0834662	U	Dado
5	0836705	H	Piastra
6	0836703	Q	Protezione
7	0836704	D	Gruppo barra
8	0837753	D	Boccola isol.
9	0836700	F	Traversino
10	0819148	D	Protezione Sx
11	0819147	Q	Protezione DX
12	0836321	N	Traversino
13	0838682	F	Distanziatore
14	0838137	M	Distanziatore
15	0001875	T	Passacavo BUSHING
16	0836834	P	Angolare
17	0842929	M	Antiparassita
–	0836881	X	AP. Gr. coperchio
18	0836837	J	Protezione
19	6380001	M	Pulsante
20	6380000	L	Bussola
21	0835172	P	Telaio
22	0834000	S	Connettore
23	0834008	Z	Bandella di massa
24	0834007	C	Bandella di alim.
25	0834009	V	Nastro isolante
26	0839474	P	Supp. sinistro
27	0839473	S	Supp. destro
28	0839472	W	Riga numerata
29	0836836	W	Squadretta
–	0842251	P	AP. Ass. Tirante
30	0839609	V	Tirante
31	0839610	P	Blocca cavo
32	0839612	U	Premi cavo
–	0842489	G	AP.Conn amp.
33	0838039	M	Barretta di fissaggio
34	0001703	U	Blocchetto maschio 50 CT
35	0001103	Q	Guida femmina
36	0001123	E	Maschio di accoppiamento
37	0001124	T	Femmina di accoppiamento
38	0001102	L	Guida maschio
39	0839611	Q	Colonnina
40	0837154	N	Supporto Tp.2
41	0836829	K	Targhetta autoadesiva
42	0674373	S	Telaio
43	0837153	Z	Supporto Tp.1
44	0838107	W	Rinforzo
45	0838108	K	Squadretta
46	0839933	R	Schermo lat.
47	0834397	W	Targhetta U.E.
48	0000730	U	Blocchetto 34 CT
49	6313132	B	Vite TC.CE 5x15
50	6311230	Q	Vite TC 3x6
51	6311236	W	Vite TC 3x20
52	6311233	Z	Vite TC 3x12
53	0680311	X	Vite TC.CE 8x15
54	6311242	W	Vite TC 4x8
55	6311245	K	Vite TC 4x15
56	6311231	R	Vite TC 3x8
57	6311232	V	Vite TC 3x10
58	0680239	Z	Vite TC 3x15
59	6331105	T	Rond.piana Ø 5,3
60	6331103	A	Rond.piana Ø 3,2
61	6331104	X	Rond.piana Ø 4 3
62	0682454	P	Rond.piana Ø 3.2
63	6332105	F	Rondella elas. Ø 5 3



64	6332103 N	Rond. elas. Ø 3,2
65	0683131 E	Rond. elas. Ø 8,4
66	6332104 B	Rond. elas. Ø 4,3
67	0683066 V	Rond. dent. Ø 3,2
68	6321103 H	Dado esag. M3
69	6321104 W	Dado esag. M4
70	0682160 C	Dado esag. M3
71	6321105 S	Dado esag. M5
72	0838038 R	Barretta
73	0001699 R	Guida d'angolo maschio
74	0001700 K	Guida d'angolo femm.
75	0001432 R	Blocchetto 104 CT
76	0819144 C	Protezione

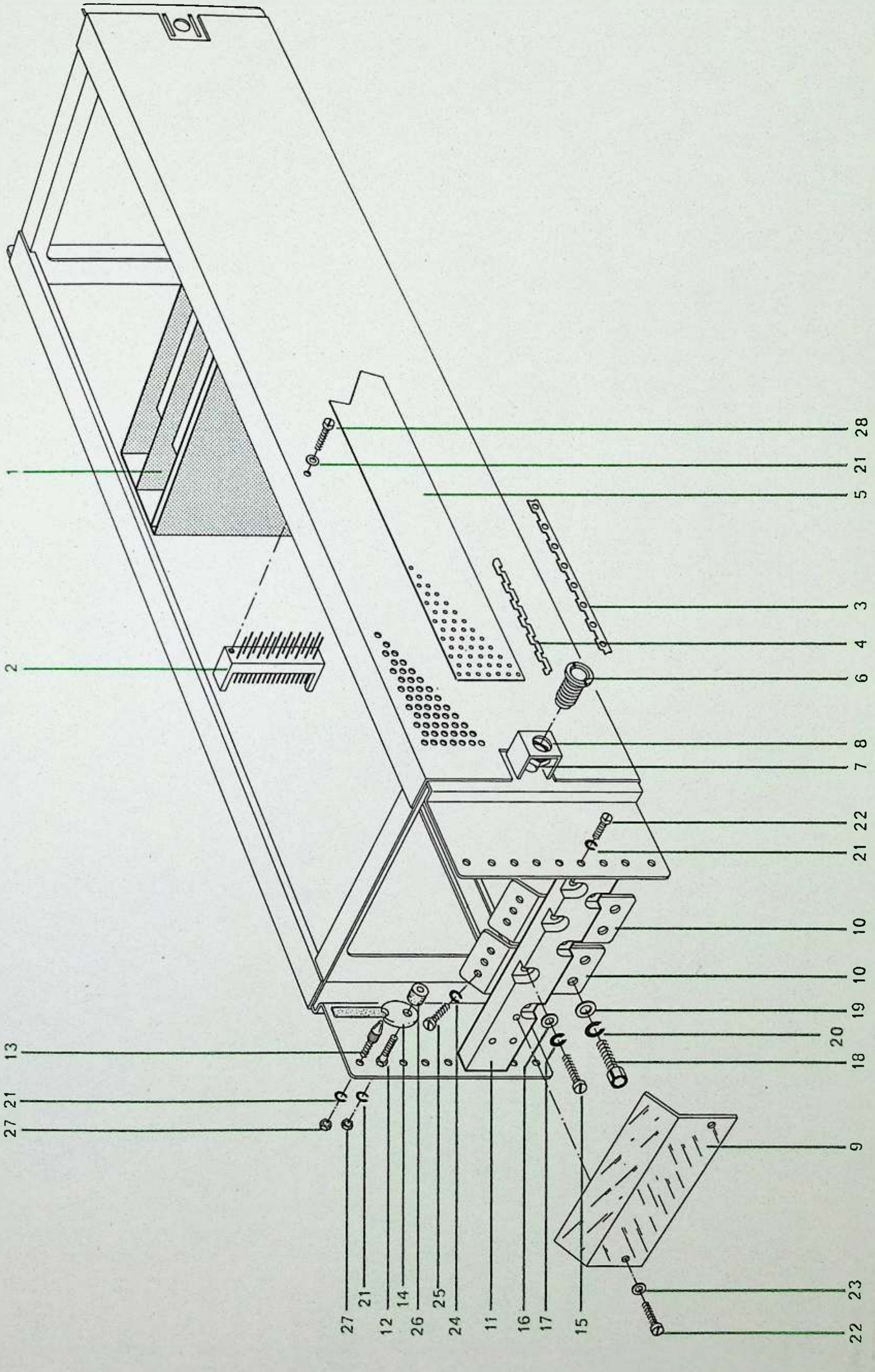


–	0842901 D	AG. Unità 1/2 modulo
1	0835534 L	Telaio 1/2 m
2	0834000 S	Connettore
3	0834008 Z	Bandella di massa
4	0834007 C	Bandella di alim.
5	0834009 V	Nastro isolante
6	0839611 Q	Colonnina
–	0835484 X	AP. Supporto coperchio
7	0839420 L	Squadretta
8	0834663 Y	Boccola
9	0834662 U	Dado
–	0842251 P	AP. Gruppo tirante
10	0839609 V	Tirante
11	0839610 P	Blocca cavo zigr.
12	0839612 U	Premi cavo
13	0837673 D	Barra laterale di tensione
14	0837754 S	Bandella isolante
15	0837752 H	Barra di massa
16	0839474 P	Supporto sinistro
17	0839473 S	Supporto destro
18	0839472 W	Riga numerata
19	6331105 T	Rond. piana Ø 5,3
20	6332105 F	Rond. elas. Ø 5,3
21	6321105 S	Dado M 5
22	6313132 B	Vite TC.CE. 5 x 15
23	6321103 M	Dado M3
24	6332103 N	Rond. dent. Ø 3,2
25	6311230 Q	Vite T.C. 3x6
26	0836706 M	Supporto per barre
27	6311234 N	Vite TC. 3x15
28	6331103 A	Rond. piana Ø 3,2
29	0837753 D	Boccola isolante

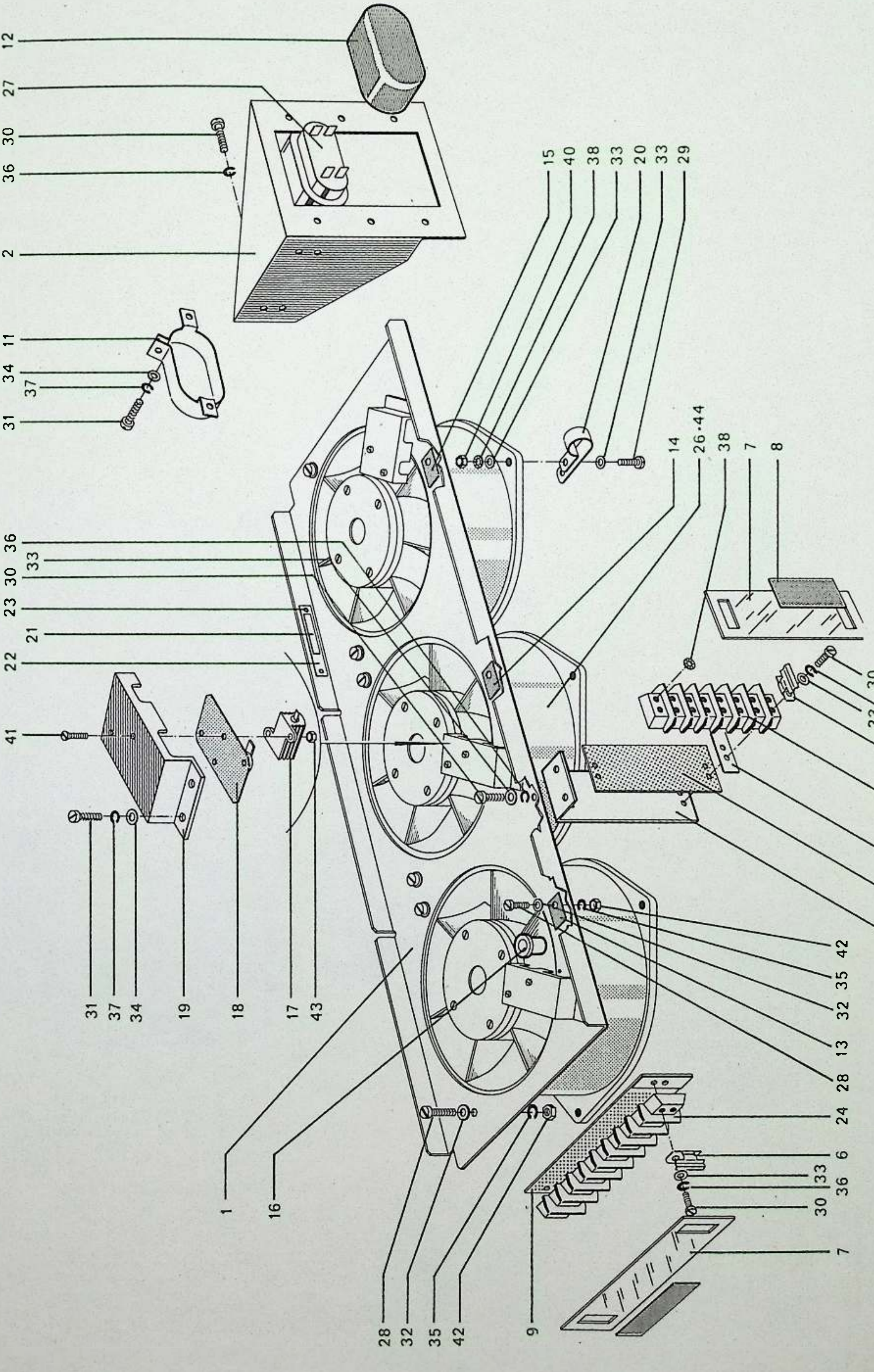


1	0645390 U	Memoria completa (MEM 180)
2	0834000 S	Connettore
3	0834008 Z	Bandella di massa
4	0834007 C	Bandella di alimentazione
5	0834009 U	Nastro isolante
6	0834663 Y	Ricettacolo Fastener
7	0834662 U	Dado
8	0835132 C	Supporto
9	0837127 X	Protezione
10	0837742 G	Piastrina
11	0837671 V	Traversino
12	0839609 V	Tirante
13	0839611 Q	Colonnina
14	0839612 U	Premi cavo
15	6311244 P	Vite TC. 4x12
16	6331104 X	Rond. Piana ∅ 4,3
17	6332104 B	Rond. elas. ∅ 4,3
18	0680311 X	Vite T.C.C.E. 8 x 15
19	0682560 L	Rond. piana ∅ 8,4 ott.
20	0683131 E	Rond. elas. ∅ 8,4 B8
21	6332103 N	Rond. elas. ∅ 3,2
22	6311231 R	Vite T.C. 3x8
23	6331103 A	Rond. piana ∅ 3,2
24	0683086 F	Rond. elas. ∅ 4,3 B8
25	0680506 T	Vite TC 4x8 ott.
26	0839610 P	Blocca cavo zigrinato
27	6321103 H	Dado M3
28	6311230 Q	Vite T.C. 3x6

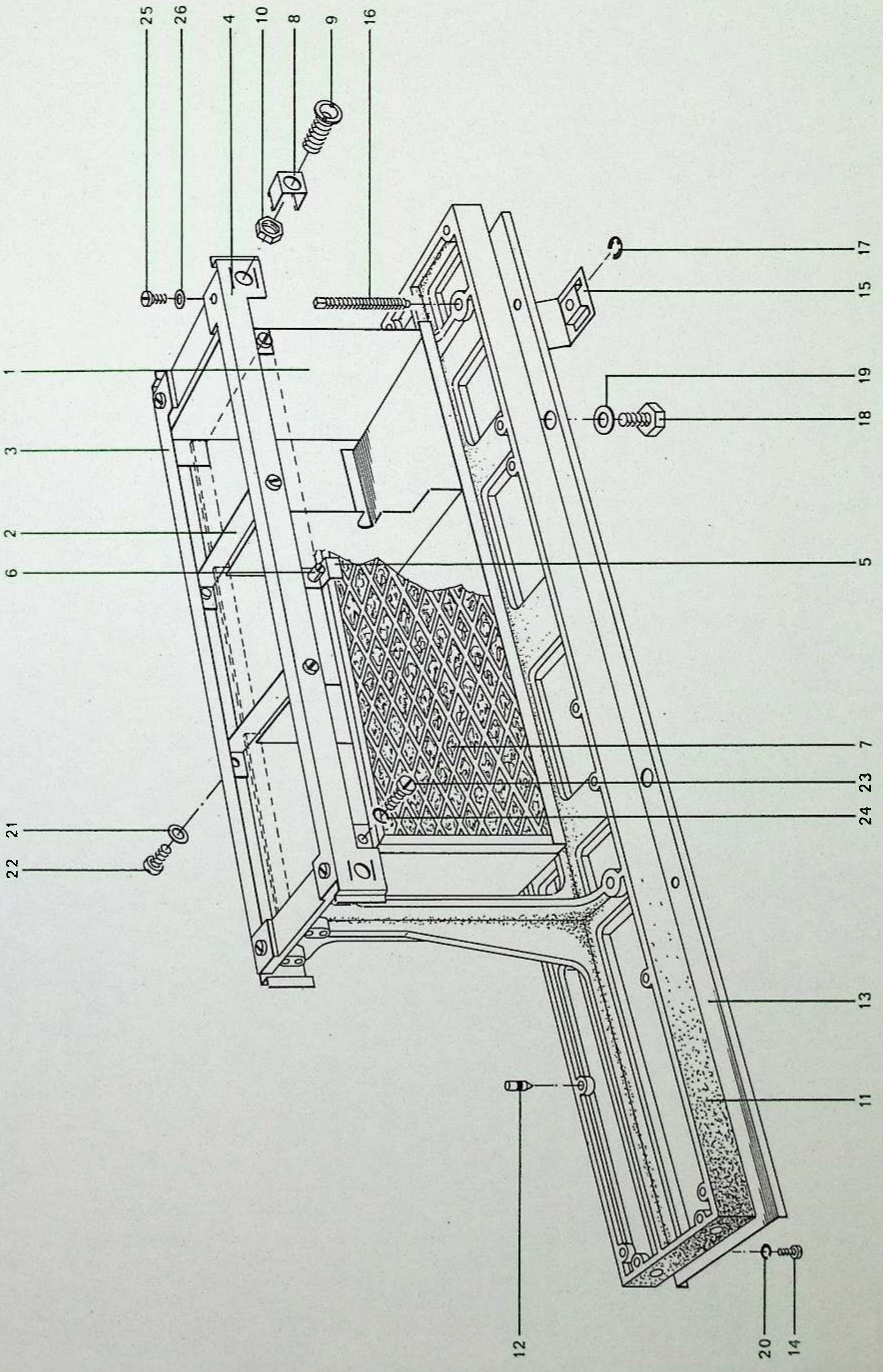
NOTA: La MEM 150 è montata dalla Mat. 77598.0231
elenco piastrine a pag. 38


27 21

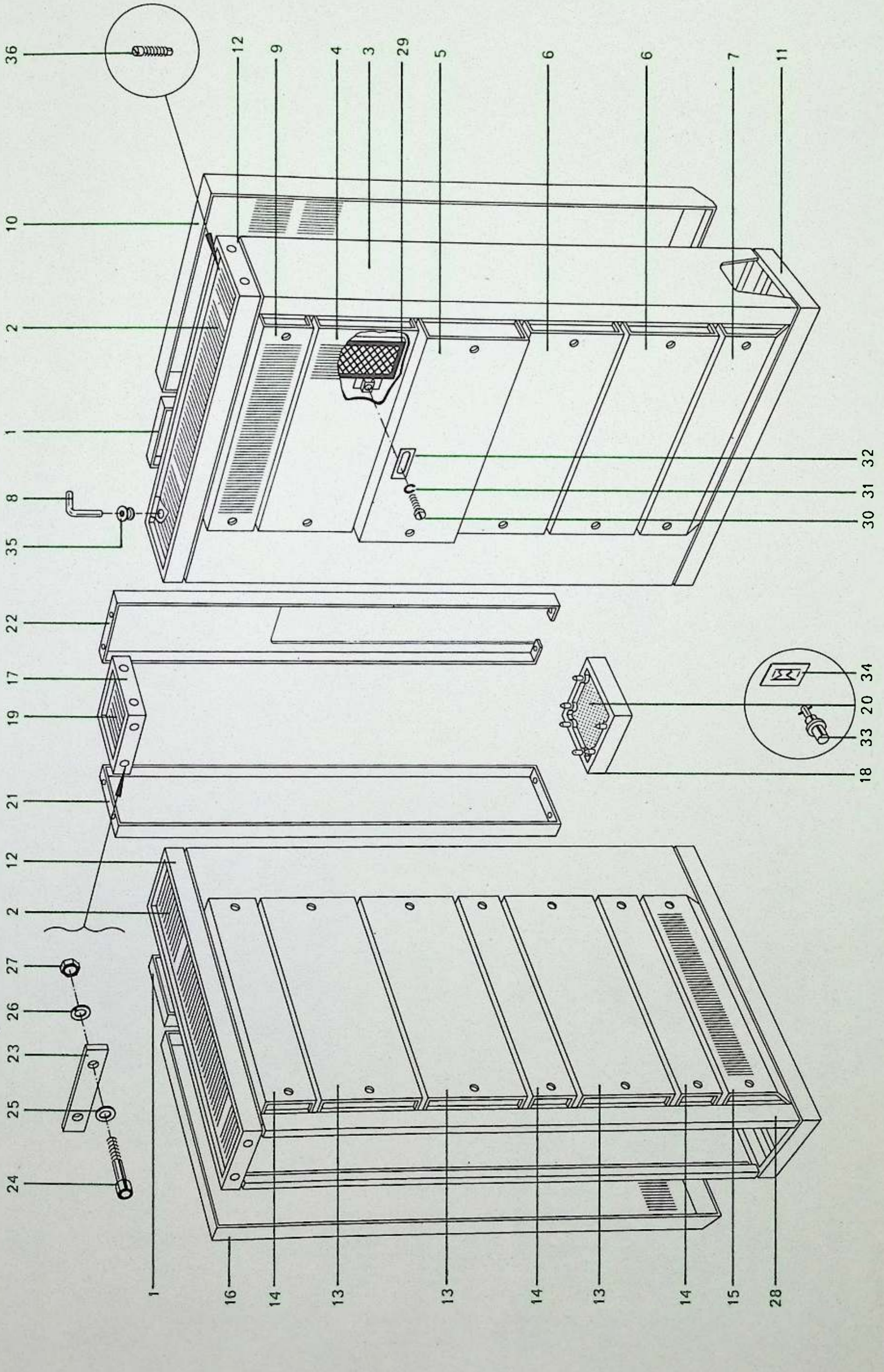
1	0837513	D	Piastra supp. ventilatori
2	0838500	U	Supp. condensatori
3	0837514	S	Supp. morsettiera
4	5612999	E	Piastrina rhodex
5	0831063	Y	Targhetta mors. proa
6	0839653	U	Molletta TP A
7	0839357	P	Protez. morsett.
8	0831766	S	Targhetta
9	5612989	D	Piastr. num. rhodex
10	0831062	U	Targhetta P20
11	0001940	Y	Fascetta per cond.
12	0001941	Z	Protez. cond.
13	0831073	Z	Targhetta vent. H1
14	0831074	N	Targhetta vent. H2
15	0831075	J	Targhetta vent. H3
16	0001876	F	Passacavo
17	4964965	B	Resis. sage 8500 8W 3%
18	0837512	H	Ass Supp. Resist.
19	0837664	Z	Scatola protez.
20	5618052	C	Serracavo Looping
21	0834416	U	Targhetta codice
22	0834397	W	Targhetta U.E.
23	0000647	G	Occhiello
24	5612544	B	Morsettiera rhodex K 609 A
25	5612447	M	Morsettiera rhodex K 605 A
26	0001945	S	Ventilatore 208V 60 Hz
27	0001514	A	Condens 2 µF 236V
28	6311258	R	Vite TC 5x15
29	6311247	T	Vite TC 4x20
30	6311245	K	Vite TC 4x15
31	6311231	R	Vite TC 3x 8
32	6331105	T	Rond.piana ø 5,3
33	6331104	X	Rond. piana ø 4,3
34	6331103	A	Rond. piana ø 3.2
35	6332105	F	Rond. elastica ø 5.3
36	6332104	B	Rond. elastica ø 4.3
37	6332103	N	Rond. elastica ø 3,2
38	0683086	F	Rond. dentata ø 4,3
39	6321105	S	Dado M5
40	6321104	W	Dado M4
41	6312725	F	Vite TS 2x8
42	0683544	J	Rond.elastica ø 2,2
43	0682865	D	Dado 2 MA
44	6550200	G	Ventilatore 220V 50 Hz


26-44

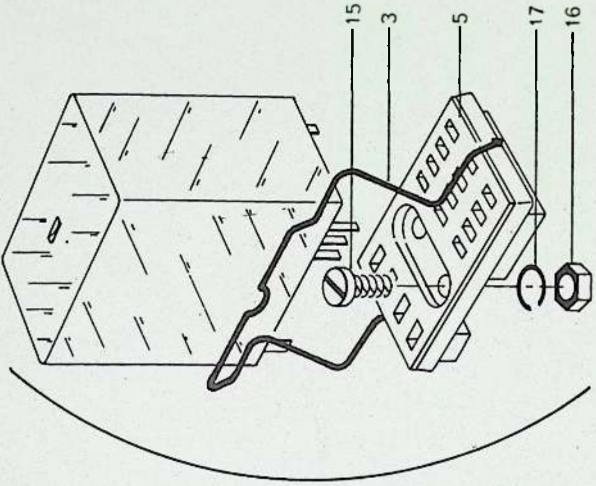
-	0842825	J	AG. Ass. piede tipo B
1	0837310	Q	Telaio vent.
2	0837701	C	Deflettore sup.
3	0674314	R	Angolare ant.
4	0674313	U	Angolare post.
5	0837706	R	Bloccaggio filtro
6	0837708	A	Vite blocc. filtro
7	0001481	J	Filtro
-	0835484	X	AP. Gruppo Fasteners
8	0839420	L	Squadretta
9	0834663	Y	Boccola
10	0834662	U	Dado
-	0674315	M	AP. Gruppo piede
11	0674275	R	Piede
12	0835809	R	Perno zigrinato
13	0835834	B	Fondale
14	0005327	C	Viti autof.
15	0835871	A	Ponticelli di regol.
16	0835874	F	Viti di regol.
17	6337112	C	Staf. elastica
18	6314160	N	Bulloni T.E. MA 10x15
19	6331110	N	Rond.piana ∅ 10,5
20	6331103	A	Rond.piana ∅ 3,2
21	6332103	N	Rond. elas. ∅ 3,2
22	6311231	R	Vite TC 3x8
23	6311243	S	Vite TC 4x10
24	6332104	B	Rond. elas. ∅ 4,3
25	6313132	B	Vite TC 5x15
26	6331105	T	Rond.piana ∅ 5,3

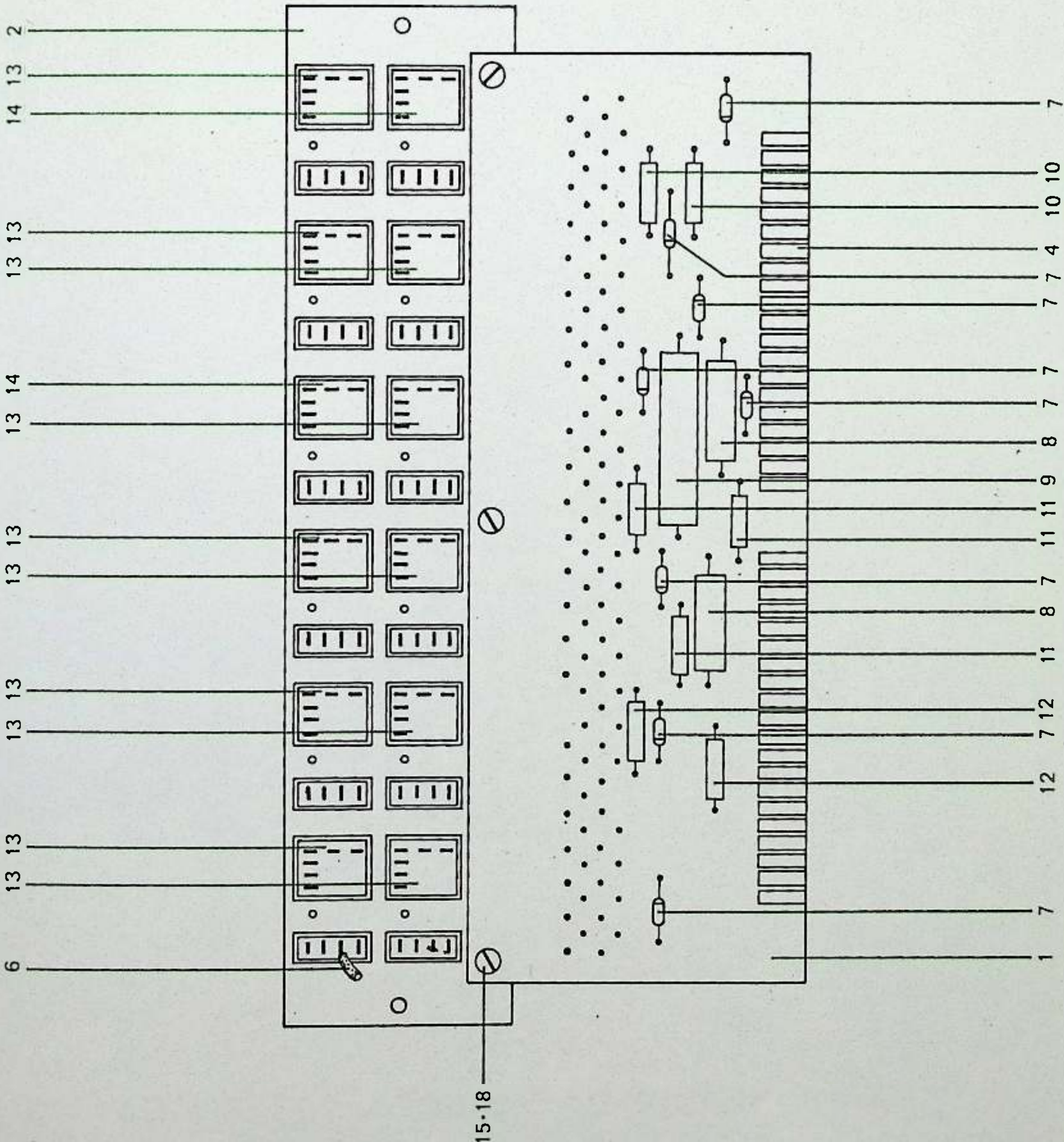


1	0817045 W	Pannello piede
2	0817036 H	Pannello superiore
3	0817081 H	Canaletta piede
4	0836507 M	Coperchio 1M
5	0836867 W	Coperchio
6	0836260 P	Coperchio 1M
7	0835944 E	Coperchio piede 1M
8	0835863 R	Perno per anello sup.
9	0836293 B	Coperchio 1/2 M
10	0674946 Z	Pannello copertura
11	0840064 M	Piede 1 M
12	08I7047 E	Anello superiore
13	0836264 M	Coperchio 1 M
14	0836286 F	Coperchio 1/2 M
15	0835910 D	Coperchio piede
16	0674949 N	Pannello copertura pacchi
17	0817083 R	Giunzione superiore
18	0674268 M	Giunzione piede
19	0817073 G	Coperchio grigliato
20	0835835 F	Fondello
21	0817113 T	Pannello
22	0676352 C	Pannello
23	0835812 Q	Distanziale
24	6313210 W	Vite T.C.C.E. 10 x 60
25	6331110 N	Rond. piana Ø 10,5
26	6332110 S	Rond. elas. Ø 10,5
27	6321110 M	Dado M 10
28	0817046 A	Regoli canaletta
29	0001482 W	Filtro per coperchio
30	0836503 L	Vite speciale
31	6331104 X	Rond. elas. Ø 3,2
32	0836302 C	Tassello fissaggio filtro
33	0834661 Q	Pulsante
34	0834665 R	Staffa elastica
35	9401020 E	Gommino
36	0835882 X	Perno filettato



–	0620120 M	AG.	Piastrina SURE
1	0833666 G		Supp. Stampato
2	0836838 Q		Supp. Relé
3	5302647 N		Molle x relé
4	5617260 W		Term. Amp. Mod F
5	5300220 M		Zoccoli x relé
6	5621696 P		Gommino Helavia
7	5823605 B		Diodi 1 x 9978
8	5041640 T		Cond. 33 µF T20 35 V
9	0001501 Q		Cond. 100 µF 50 V
10	4923850 M		Res. 680 0,25 W
11	4933645 S		Res . 430 0,5 W
12	4924370 H		Res. 2,2 K 0,25 W
13	5302642 R		Relé 4 Scambi 24V
14	5303460 D		Relé 4 scambi 12V
15	6311231 R		Vite M3 x 8
16	6321103 H		Dado ES M3
17	6332305 J		Rond. dent. ø 3,2
18	6331103 A		Rond. piana ø 3,2




15-18

MEM 170

1	0616034 G	Piastrina FILU-A
2	0616033 K	Piastrina FICO-A
3	0615212 U	Piastrina CAP 3
4	0615213 Y	Piastrina CAL 4
5	0611501 G	Piastrina NOR E
6	0611420 T	Piastrina INPO
7	0612130 S	Piastrina UNIV
8	0614024 X	Piastrina INIB 0 E
9	0612038 G	Piastrina FLIP 0 1
10	0617120 W	Piastrina INTE
11	0613021 D	Piastrina PREA
12	0614128 R	Piastrina PIME 0 B
13	0615230 R	Piastrina GE14
14	0611504 D	Piastrina LOBE
15	0612144 Z	Piastrina MOBE 0 B
16	0618014 X	Piastrina MAME
17	0616020 N	Piastrina FICO D

COND. UNIVIBRATORI MEM 170

18	5006285 N	COND 820 PF
19	5006396 V	COND 1500 PF

MEM 150

20	0611239 C	Piastrina FLIP 0 D
21	0611511 Q	Piastrina CAP 2
22	0611017 X	Piastrina MEMO 2A
23	0611101 G	Piastrina NOR E
24	0611513 Y	Piastrina CAL 4A
25	0611120 T	Piastrina INPO A
26	0611230 S	Piastrina UNIV A
27	0611030 P	Piastrina ALMO
28	0611620 M	Piastrina FICO D

COND. MEM 150

29	5006285 N	Cond. 820 PF
30	5006396 V	Cond. 1500 PF
31	5021935 R	Cond. 390 PF

1	0617312 E	PST ALAM-A
2	0615210 P	PST CAP-1
3	0615212 U	PST CAP-3
4	0615217 Z	PST CAP-4
5	0610148 M	PST DECO
6	0610149 R	PST DELE
7	0616020 H	PST FICO-D
8	0612027 J	PST FLIP-A
9	0612021 H	PST FLIP-8
10	0612041 B	PST FLIC
11	0612039 C	PST FLIP 0 D
12	0610151 Q	PST FOGE
13	0616018 F	PST INCRE
14	0611428 S	PST INPO 0 E
15	0611520 V	PST INZE 0 A
16	0615311 J	PST LIDE A
17	0617316 F	PST LUME 0 A
18	0617318 Y	PST LURE 0 A
19	0611500 F	PST NOR-A
20	0611502 L	PST NOR-I
21	0611503 Q	PST NORS 2
22	0611509 A	PST NORR-BO
23	0611511 V	PST NORR-CA
24	0611512 H	PST NORR-DA
25	0618030 T	PST PONT 0 H
26	0611505 H	PST RIGE
27	0617240 S	PST ALUN-A
28	0612130 S	PST UNIV
29	0610150 P	PST RIAN
30	0610152 U	PST LOSP
31	0610153 Y	PST LOMA
32	0616021 A	PST FICO-E
33	0612135 U	PST UNRA-B
34	0610155 R	PST SPAM
35	0612322 A	PST GEMA-C
36	0610157 Z	PST INVE
37	0610187 C	PST FIPI
38	0610202 D	PST GUCI

GOC 200

1	0611428 S	PST INPO-A
2	0611520 V	PST INZE-A
3	0615210 P	PST CAP 1 A
4	0615211 Q	PST CAP 2 A
5	0615212 U	PST CAP 3 A
6	0615217 Z	PST CAP 4 A
7	0616020 H	PST FICO D
8	0612027 J	PST FLIP-A
9	0612021 H	PST FLIP-B
10	0612039 C	PST FLIP-D
11	0612322 A	PST GEMA-C
12	0611500 F	PST NOR-A
13	0611501 G	PST NOR-E
14	0611509 A	PST NORR-BO
15	0611511 V	PST NORR-CA
16	0611523 F	PST NORR-CD
17	0611512 H	PST NORR-DA
18	0611503 Q	PST NORS-A
19	0611519 X	PST REDI 1
20	0615220 Q	PST SIM-A
21	0617240 S	PST ULUM-A
22	0612130 S	PST UNIV-A
23	0612135 U	PST UNRA B

OPZ 201

24	0611523 F	PST NORR-CD
25	0611501 G	PST NOR-A
26	0611500 F	PST NOR-E
27	0615210 P	PST CAP 1 A
28	0615217 Z	PST CAP 4 A
29	0612027 J	PST FLIP A
30	0612039 C	PST FLIP D
31	0611503 Q	PST NOR-S
32	0617240 S	PST ULUN-A
33	0612130 S	PST UNIV-A
34	0612135 U	PST UNRA-B

COND. UNIVIBRATORI OPZ 201

35	5041015 X	COND 0,33 μF
36	5037435 G	COND 10 μF
37	0000922 A	COND 1,8 μF
38	5041025 V	COND 0,47 μF

GOC 100

1	0611428 S	PST INFO-E
2	0611520 V	PST INZE-A
3	0612135 U	PST UNRA-B
4	0615213 Y	PST CAL 4-A
5	0615210 P	PST CAP 1-A
6	0615211 Q	PST CAP 2-A
7	0615217 Z	PST CAP 4-A
8	0616020 H	PST FICO D
9	0612027 J	PST FLIP-A
10	0612021 H	PST FLIP-B
11	0612039 C	PST FLIP-D
12	0612322 A	PST GEMA-C
13	0611502 L	PST NOR I
14	0611500 F	PST NOR A
15	0611501 G	PST NOR E
16	0611523 E	PST NORR-CD
17	0611512 H	PST NORR-DA
18	0611510 U	PST NORR-DS
19	0611503 Q	PST NORS-A
20	0615220 Q	PST SIMA-A
21	0617240 S	PST ULUN-A
22	0612130 S	PST UNIV-A

COND. UNIVIBRATORI GOC 100

23	0000922 A	COND. 1,8 μF Tant
24	5031055 S	COND. 1 μF Tant
25	5037435 G	COND. 10 μF Tant
26	5041200 T	COND. 3,3 μF Tant
27	5037500 R	COND. 15 μF Tant

OPZ 101

28	0617240 S	PST ULUN-A
29	0615210 P	PST CAP 1 A
30	0615211 Q	PST CAP 2 A
31	0615217 Z	PST CAP 4 A
32	0611239 C	PST FLIP D
33	0611523 E	PST NORR CD
34	0611512 H	PST NORR DA
35	0611503 Q	PST NORS A
36	0612130 S	PST UNIV A
37	0612135 U	PST UNRA B

COND. UNIVIBRATORI OPZ 101

38	0000922 A	COND 1,8 μF tant
39	5037435 G	COND 10 μF tant
40	5041200 T	COND 3,3 μF tant
41	5031055 S	COND 1 μF tant
42	5037500 R	COND 15 μF tant

OPZ 141

1	0615212 U	PST CAP 3
2	0612021 H	FLIP-B
3	0616018 F	INCRE
4	0611500 F	NOR-A
5	0611509 A	NORR-BO
6	0611511 V	NORR-CA
7	0611503 Q	NORS
8	0611505 H	RIGE
9	0612130 S	UNIV
10	0610151 Q	FOGE

COND. UNIVIBRATORI OPZ 141

11	5041325 M	COND. 5,6 µF Tant
12	5006285 N	COND. 820 PF FILM

OPZ 143

13	0610153 Y	PST LOMA
14	0610152 U	PST LOSP
15	0610155 R	PST SPAM

ATA 142

16	0615217 Z	PST CAP 4
17	0612027 J	PST FLIP-A
18	0612021 H	PST FLIP-B
19	0612039 C	PST FLIP-D
20	0617318 Y	PST LURE-A
21	0611500 F	PST NOR-A
22	0611502 G	PST NOR-E
23	0611509 A	NORR-BO
24	0611511 V	NORR-CA
25	0618025 U	PONT 8
26	0612130 S	UNIV
27	0612135 U	UNRA-B
28	0612322 A	GEMA C

COND. UNIVIBRATORI ATA 142

29	0000720 G	COND. 22 µF tant COZPG021400
30	5041330 L	COND. 5,6 µF tant
31	5041200 T	COND. 3,3 µF tant
32	0000992 R	COND. 0,15 µF FILM
33	5041325 M	COND. 5,6 µF tant
34	5007200 L	COND. 0,68000 µF FILM

ATA 145

35	0610153 Y	PST LOMA
36	0610152 U	PST LOSP
37	0610155 R	PST SPAM

ATA 146

38	0618029 V	PST PONT Ø G

COND. UNIVIBRATORI ATA 146

39	5041015 Y	COND. 0,33 uF Tant.
40	5006882 W	COND. 33000 PF

ATA 147

41	0618029 V	PST PONT Ø G

COND. UNIVIBRATORI ATA 147

42	0000992 R	COND. 0,15 uF Tant
43	5006882 W	COND. 33000 PF FILM

ATA 148

44	0618031 U	PST PONT Ø L

COND. UNIVIBRATORI ATA 148

45	5003395 L	COND. 0,1 uF FILM
46	5006882 W	COND. 33000 PF FILM

ATA 149

47	0612135 U	PST UNRA B

COND. UNIVIBRATORI ATA 149

48	5037435 G	COND. 10 uF Tant
49	5041015 X	COND. 0,33 uF Tant
50	5006882 W	COND. 33000 PF FILM

REPERTORIO NUMERICO

Codice	Pag.	Rif.
0000647G	30	23
0000720G	42	29
0000729B	8	28
0000730U	22	48
0000788H	2	30
0000922A	40	37
0000922A	41	23
0000922A	41	38
0000992R	42	32
0000992R	43	42
0001102L	6	93
0001102L	22	38
0001103Q	6	96
0001103Q	22	35
0001123E	6	95
0001123E	22	36
0001124T	6	94
0001124T	22	37
0001218V	14	14
0001220X	2	20
0001220X	4	17
0001238X	2	7
0001238X	4	16
0001238X	14	12
0001244X	14	13
0001259V	2	19
0001292K	16	6
0001292K	18	2
0001299H	8	15
0001307M	4	37
0001315S	14	10
0001320Z	4	36
0001354S	14	22
0001355W	14	21
0001356A	14	5
0001357E	14	1
0001370W	4	4
0001370W	20	4
0001373F	14	23
0001373F	16	5
0001373F	18	3
0001373F	18	9
0001375Y	8	27
0001383Q	18	8
0001385H	4	5
0001402S	2	11
0001402S	8	5
0001402S	10	38
0001422B	4	11
0001422Q	12	114

Codice	Pag.	Rif.
0001432R	24	75
0001449G	14	11
0001474E	14	2
0001481J	32	7
0001482W	34	29
0001501Q	36	9
0001506V	8	31
0001514A	30	27
0001518B	14	7
0001519F	14	3
0001569C	8	39
0001614C	2	26
0001614C	4	40
0001614C	10	62
0001693X	4	59
0001699R	24	73
0001700K	24	74
0001703U	4	58
0001703U	22	34
0001710G	8	35
0001787Z	14	42
0001788N	14	38
0001791R	14	41
0001798P	2	43
0001858W	4	10
0001875T	2	21
0001875T	10	47
0001875T	14	16
0001875T	22	15
0001876F	12	68
0001876F	30	16
0001883K	14	40
0001884G	14	9
0001885C	14	8
0001940Y	30	11
0001941Z	30	12
0001945S	30	26
0002114E	14	4
0002115A	14	6
0002138H	2	10
0002138X	8	4
0003128H	10	59
0005327C	32	14
0610148M	39	5
0610149R	39	6
0610150P	39	29
0610151Q	39	12
0610151Q	42	10
0610152U	39	30
0610152U	42	14

Codice	Pag.	Rif.
0610152U	43	36
0610153Y	39	31
0610153Y	42	13
0610153Y	43	35
0610155R	39	34
0610155R	42	15
0610155R	43	37
0610157Z	39	36
0610187C	39	37
0610202D	39	38
0611017X	38	22
0611030P	38	27
0611101G	38	23
0611120T	38	25
0611230S	38	26
0611239C	38	20
0611239C	41	32
0611420T	38	6
0611428S	39	14
0611428S	40	1
0611428S	41	1
0611500F	39	19
0611500F	40	12
0611500F	40	26
0611500F	41	14
0611500F	42	4
0611500F	42	21
0611501G	38	5
0611501G	40	13
0611501G	40	25
0611501G	41	15
0611502G	42	22
0611502L	39	20
0611502L	41	13
0611503Q	39	21
0611503Q	40	18
0611503Q	40	31
0611503Q	41	19
0611503Q	41	35
0611503Q	42	7
0611504D	38	14
0611505H	39	26
0611505H	42	8
0611509A	39	22
0611509A	40	14
0611509A	42	5
0611509A	42	23
0611510U	41	18
0611511Q	38	21
0611511V	39	23

Codice	Pag.	Rif.
0611511V	40	15
0611511V	42	6
0611511V	42	24
0611512H	39	24
0611512H	40	17
0611512H	41	17
0611512H	41	34
0611513Y	38	24
0611519X	40	19
0611520V	39	15
0611520V	40	2
0611520V	41	2
0611523F	40	16
0611523F	40	24
0611523E	41	16
0611523E	41	33
0611620M	38	28
0612021H	39	9
0612021H	40	9
0612021H	41	10
0612021H	42	2
0612021H	42	18
0612027J	39	8
0612027J	40	8
0612027J	40	29
0612027J	41	9
0612027J	42	17
0612038G	38	9
0612039C	39	11
0612039C	40	10
0612039C	40	30
0612039C	41	11
0612039C	42	19
0612041B	39	10
0612130S	38	7
0612130S	39	28
0612130S	40	22
0612130S	40	33
0612130S	41	22
0612130S	41	36
0612130S	42	9
0612130S	42	26
0612135U	39	33
0612135U	40	23
0612135U	40	34
0612135U	41	3
0612135U	41	37
0612135U	42	27
0612135U	43	47
0612144Z	38	15

Codice	Pag.	Rif.
0612322A	39	35
0612322A	40	11
0612322A	41	12
0612322A	42	28
0613021D	38	11
0614024X	38	8
0614128R	38	12
0615210P	39	2
0615210P	40	3
0615210P	40	27
0615210P	41	5
0615210P	41	29
0615211Q	40	4
0615211Q	41	6
0615211Q	41	30
0615212U	38	3
0615212U	39	3
0615212U	40	5
0615212U	42	1
0615213Y	38	4
0615213Y	41	4
0615217Z	39	4
0615217Z	40	6
0615217Z	40	28
0615217Z	41	7
0615217Z	41	31
0615217Z	42	16
0615220Q	40	20
0615220Q	41	20
0615230R	38	13
0615311J	39	16
0616018F	39	13
0616018F	42	3
0616020H	39	7
0616020H	40	7
0616020H	41	8
0616020N	38	17
0616021A	39	32
0616033K	38	2
0616034G	38	1
0617120W	38	10
0617240S	39	27
0617240S	40	21
0617240S	40	32
0617240S	41	21
0617240S	41	28
0617312E	39	1
0617316F	39	17
0617318Y	39	18
0617318Y	42	20

Codice	Pag.	Rif.
0618014X	38	16
0618025U	42	25
0618029V	43	38
0618029V	43	41
0618030T	39	25
0618031U	43	44
0620116S	8	3
0620117W	6	103
0620118K	4	3
0620119P	6	102
0620120M	36	
0620142U	8	58
0620145R	12	116
0620146W	12	115
0620233Z	4	44
0643394H	16	AG
0645390U	28	1
0645810P	18	AG
0645811Q	18	AG
0646519F	20	AG
0674215K	2	31
0674268M	34	18
0674275R	32	11
0674313U	32	4
0674314R	32	3
0674315M	32	AP
0674373S	22	42
0674946Z	34	10
0674949N	34	16
0676352C	34	22
0680135W	10	25
0680135W	10	54
0680205H	12	111
0680239Z	6	82
0680239Z	22	58
0680311X	22	53
0680311X	28	18
0680338X	8	47
0680506T	10	50
0680506T	14	62
0680506T	28	25
0680534D	16	11
0680540D	14	63
0680550E	10	22
0680550E	10	34
0680575A	10	19
0680591S	10	23
0680591S	12	91
0680597V	6	88
0680614A	2	58

Codice	Pag.	Rif.
0680614A	6	85
0680614A	10	27
0682160C	24	70
0682260E	16	13
0682454P	6	83
0682454P	12	113
0682454P	22	62
0682456X	10	35
0682456X	10	52
0682456Y	14	54
0682481G	2	61
0682557V	6	89
0682557Y	10	30
0682557Y	12	92
0682560L	2	59
0682560L	6	86
0682560L	10	28
0682560L	28	19
0682865D	30	43
0683040M	10	26
0683040M	10	57
0683060P	12	112
0683066V	6	84
0683066V	24	67
0683081S	16	12
0683086F	10	24
0683086F	10	36
0683086F	10	51
0683086F	28	24
0683086F	30	38
0683092F	6	90
0683092F	10	31
0683092F	12	93
0683131E	2	60
0683131E	6	87
0683131E	10	29
0683131E	24	65
0683131E	28	20
0683544J	30	42
0800831M	12	95
0817036H	34	2
0817045W	34	1
0817046A	34	28
0817047E	34	12
0817073G	34	19
0817083R	34	17
0817113T	34	21
0818080N	12	AP
0818277R	10	AG
0818278E	10	1

Codice	Pag.	Rif.
0818294P	4	38
0819144C	24	76
0819147Q	22	11
0819148D	22	10
0819152L	16	1
0819179C	12	72
0819368B	2	14
0830388L	2	42
0830388L	4	45
0830388L	6	60
0830388L	12	71
0830513T	4	27
0830513T	8	20
0830514Q	4	30
0830670J	4	AP
0830671K	8	AP
0831062U	30	10
0831063Y	30	5
0831073Z	30	13
0831074N	30	14
0831075J	12	67
0831075J	30	15
0831766S	18	15
0831766S	30	8
0833359N	6	64
0833359N	12	83
0833666G	36	1
0834000S	22	22
0834000S	26	2
0834000S	28	2
0834007C	22	24
0834007C	26	4
0834007C	28	4
0834008Z	22	23
0834008Z	26	3
0834008Z	28	3
0834009V	22	25
0834009V	26	5
0834009U	28	5
0834229E	10	18
0834397W	16	14
0834397W	22	47
0834397W	30	22
0834416U	16	15
0834416U	18	14
0834416U	30	21
0834661Q	4	9
0834661Q	12	109
0834661Q	34	33
0834662U	2	33

Codice	Pag.	Rif.
0834662U	4	24
0834662U	12	82
0834662U	14	25
0834662U	22	4
0834662U	26	9
0834662U	28	7
0834662U	32	10
0834663Y	2	32
0834663Y	4	23
0834663Y	12	81
0834663Y	14	26
0834663Y	22	3
0834663Y	26	8
0834663Y	28	6
0834663Y	32	9
0834665R	4	8
0834665R	12	110
0834665R	34	34
0835132C	14	27
0835132C	28	8
0835172P	22	21
0835484X	14	AG
0835484X	26	AP
0835484X	32	AP
0835534L	26	1
0835809R	32	12
0835812Q	34	23
0835834B	32	13
0835835F	34	20
0835863R	34	8
0835871A	32	15
0835874F	32	16
0835875B	34	3
0835882X	34	36
0835910D	34	15
0835944E	34	7
0836260P	34	6
0836264M	34	13
0836286F	34	14
0836293B	34	9
0836302C	34	32
0836321N	22	12
0836400N	6	68
0836405B	2	1
0836503L	34	30
0836507M	34	4
0836601E	4	34
0836602J	8	32
0836603N	12	70
0836605F	6	63

Codice	Pag.	Rif.
0836606K	4	35
0836607P	8	33
0836608C	4	18
0836613B	4	1
0836615U	8	10
0836617C	2	41
0836619V	2	28
0836621U	2	24
0836622G	2	23
0836623C	2	27
0836625V	12	75
0836626H	2	40
0836629S	2	37
0836630W	2	36
0836633D	2	2
0836634S	6	65
0836652B	10	5
0836653F	12	97
0836654U	12	108
0836657G	10	15
0836663G	10	3
0836664V	10	32
0836665Z	10	11
0836667H	10	60
0836667U	2	35
0836669S	12	96
0836672D	12	77
0836674W	12	76
0836675S	12	73
0836676E	12	74
0836692P	10	45
0836693K	10	9
0836695C	10	16
0836700F	22	9
0836703Q	22	6
0836704D	22	7
0836705H	22	5
0836706M	26	26
0836811Q	10	17
0836819J	12	106
0836829R	22	41
0836833S	4	22
0836834P	22	16
0836836W	22	29
0836837J	22	18
0836838Q	36	2
0836839L	4	53
0836840J	4	6
0836841K	4	2
0836845L	4	7

Codice	Pag.	Rif.
0836867W	34	5
0836869P	4	43
0836872S	12	88
0836873W	12	89
0836874K	12	90
0836877X	4	41
0836879Q	6	66
0836881X	22	AP
0836882B	12	94
0837106D	4	57
0837107H	4	54
0837108W	4	55
0837109S	8	1
0837111M	8	18
0837113V	8	9
0837114J	8	6
0837116S	8	25
0837117W	8	26
0837118K	8	36
0837127X	28	9
0837153Z	22	43
0837154N	22	40
0837310G	32	1
0837512H	30	18
0837513D	30	1
0837514S	30	3
0837519X	8	2
0837664Z	30	19
0837671V	28	11
0837673D	26	13
0837678T	2	9
0837679K	10	4
0837701C	32	2
0837706R	32	5
0837708A	32	6
0837742G	28	10
0837752H	26	15
0837753D	22	8
0837753D	26	29
0837754S	26	14
0837773F	16	3
0837774U	16	2
0838038R	24	72
0838039M	6	92
0838039M	22	33
0838107W	22	44
0838108K	22	45
0838136R	8	34
0838137M	10	2
0838137M	22	14

Codice	Pag.	Rif.
0838499S	18	13
0838500U	30	2
0838666W	14	18
0838669K	14	39
0838670R	14	43
0838682F	22	13
0838685U	2	13
0838685U	4	21
0838819B	18	7
0838820H	18	12
0838985K	14	36
0838986X	14	35
0838987T	14	33
0838988Q	14	34
0839164G	18	1
0839165C	16	4
0839165C	18	6
0839167L	18	5
0839167L	18	11
0839261D	6	62
0839355F	2	39
0839356K	2	16
0839357P	4	25
0839357P	30	7
0839361F	2	15
0839363P	4	56
0839418J	4	19
0839418J	12	87
0839420L	2	34
0839420L	12	80
0839420L	22	2
0839420L	26	7
0839420L	32	8
0839421M	4	20
0839421M	12	79
0839472W	22	28
0839472W	26	18
0839473S	22	27
0839473S	26	17
0839474P	22	26
0839474P	26	16
0839609V	22	30
0839609V	26	10
0839609V	28	12
0839610P	22	31
0839610P	26	11
0839610P	28	26
0839611Q	22	39
0839611Q	26	6
0839611Q	28	13

Codice	Pag.	Rif.
0839612U	22	32
0839612U	26	12
0839612U	28	14
0839615R	14	24
0839616Y	14	30
0839618N	14	32
0839620Q	14	31
0839621R	14	29
0839622V	14	20
0839624N	14	17
0839625J	14	28
0839626W	14	47
0839627S	14	45
0839634P	14	44
0839637T	14	49
0839653U	2	18
0839653U	30	6
0839933R	22	46
0840064M	34	11
0840093V	22	1
0842251P	22	
0842251P	26	AP
0842489G	22	AP
0842616G	2	8
0842825J	32	AG
0842845L	4	AP
0842847U	8	AP
0842848R	4	AP
0842849M	8	AP
0842850K	4	AP
0842852Y	8	AP
0842859N	2	29
0842861M	4	AP
0842862Z	4	AP
0842863V	2	AP
0842866S	2	AG
0842867W	2	AP
0842873W	10	48
0842874K	10	12
0842875P	10	33
0842876T	10	AP
0842877X	10	AP
0842878L	10	AP
0842879Q	12	AG
0842901D	26	AG
0842929M	22	17
0842962T	4	AP
0842967Y	12	107
0899653U	4	33
1925110E	14	48

Codice	Pag.	Rif.
3543104P	2	17
3543104P	10	10
3543104P	12	78
3543106X	16	16
4923850M	36	10
4924370H	36	12
4933645S	36	11
4964965B	30	17
4970322Q	12	100
4970325S	2	12
4971020P	8	30
4971862Q	8	38
4972110K	12	98
4972320Q	12	99
4972641Z	4	15
4972940P	6	100
4973170M	6	61
4973399W	4	14
4973507L	8	37
4973870K	10	43
4974634N	8	29
4995204V	8	12
4999530V	8	7
4999550X	8	8
5003395L	43	45
5006285N	38	18
5006285N	38	29
5006285N	42	12
5006396V	38	19
5006396V	38	30
5006882W	43	40
5006882W	43	43
5006882W	43	46
5006882W	43	50
5007200L	42	34
5021935R	38	31
5027650B	2	6
5031055S	41	24
5031055S	41	41
5032095J	2	5
5037435G	40	36
5037435G	41	25
5037435G	41	39
5037435G	43	48
5037500R	41	27
5037500R	41	42
5038570Z	6	101
5041015X	40	35
5041015Y	43	39
5041015X	43	49

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Codice	Pag.	Rif.
5041025V	40	38
5041200T	41	26
5041200T	41	40
5041200T	42	31
5041325M	42	11
5041325M	42	33
5041330L	42	30
5041640T	36	8
5045649X	8	13
5048088H	8	11
5048099D	10	39
5048260K	10	42
5048295Y	10	41
5048822U	10	40
5091062L	10	37
5092100J	12	69
5092250E	10	46
5141200L	4	49
5141201M	4	50
5254900K	4	51
5300220M	36	5
5302642R	36	13
5302647N	36	3
5303460D	36	14
5306510G	20	1
5326624X	4	13
5361011M	4	52
5363150R	4	42
5363150R	12	103
5363152W	4	48
5363153S	4	46
5363154P	4	47
5363154P	12	104
5421010S	2	4
5421014Y	8	17
5427060F	18	4
5427060F	18	10
5427068F	16	7
5441302W	10	14
5445215J	2	3
5445220R	2	38
5445222W	2	22
5445225K	4	12
5541340N	2	25
5541340N	4	39
5541340N	10	61
5575094G	12	105
5610021W	8	16
5610021W	12	102
5610024T	8	14

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5610024T	12	101
5612430C	20	2
5612447M	30	25
5612455E	14	19
5612544B	30	24
5612989D	30	9
5612994H	20	3
5612999E	30	4
5613328S	14	46
5613520F	14	37
5613520F	14	50
5616413J	8	19
5616415B	4	26
5616418G	8	23
5616450D	8	21
5616452T	8	22
5616454B	8	24
5616455F	4	28
5616457P	4	29
5616459G	4	31
5617260W	36	4
5618052C	30	20
5618320N	14	15
5621696P	36	6
5812010W	10	13
5812025Z	10	44
5823605B	36	7
6221104W	6	91
6311230Q	6	72
6311230Q	8	43
6311230Q	22	50
6311230Q	26	25
6311230Q	28	28
6311231R	2	55
6311231R	6	69
6311231R	8	48
6311231R	10	53
6311231R	14	59
6311231R	22	56
6311231R	28	22
6311231R	30	31
6311231R	32	22
6311231R	36	15
6311232V	2	50
6311232V	6	80
6311232V	8	46
6311232V	14	55
6311232V	22	57
6311233Z	22	52
6311234N	2	57

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6311234N	14	65
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6311236W	10	6
6311236W	22	51
6311242W	2	54
6311242W	10	49
6311242W	14	61
6311242W	18	16
6311242W	20	6
6311242W	22	54
6311243S	14	51
6311243S	16	9
6311243S	18	18
6311243S	32	23
6311244P	2	53
6311244P	6	70
6311244P	20	5
6311244P	28	15
6311245K	2	47
6311245K	6	81
6311245K	14	60
6311245K	18	17
6311245K	22	55
6311245K	30	30
6311247T	6	67
6311247T	14	64
6311247T	30	29
6311249L	2	52
6311256Y	2	51
6311258R	30	28
6311266Z	8	45
6312725F	30	41
6312732K	6	77
6312732K	8	40
6312733P	8	42
6312733P	16	8
6312736L	2	62
6312736L	6	79
6312736L	12	63
6312744D	8	41
6313132B	6	97
6313132B	22	49
6313132B	26	22
6313132B	32	25
6313210W	34	24
6314160N	32	18
6321103H	2	46

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6321103H	6	76
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6321103H	24	68
6321103H	28	27
6321103H	36	16
6321103M	26	23
6321104W	8	57
6321104W	14	53
6321104W	18	20
6321104W	24	69
6321104W	30	40
6321105S	6	98
6321105S	8	56
6321105S	24	71
6321105S	26	21
6321105S	30	39
6321110M	34	27
6331103A	2	45
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6331103A	8	49
6331103A	10	8
6331103A	12	65
6331103A	14	58
6331103A	22	60
6331103A	26	28
6331103A	28	23
6331103A	30	34
6331103A	32	20
6331103A	36	18
6331104X	2	48
6331104X	6	73
6331104X	8	51
6331104X	10	20
6331104X	10	58
6331104X	20	8
6331104X	22	61
6331104X	28	16
6331104X	30	33
6331104X	34	31
6331105T	8	50
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6331105T	30	32
6331105T	32	26
6331110N	32	19
6331110N	34	25
6332103N	2	44

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6332103N	6	75
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6332103N	12	84
6332103N	24	64
6332103N	26	24
6332103N	28	21
6332103N	30	37
6332103N	32	21
6332104B	2	49
6332104B	6	74
6332104B	8	53
6332104B	10	21
6332104B	10	56
6332104B	16	10
6332104B	20	7
6332104B	24	66
6332104B	28	17
6332104B	30	36
6332104B	32	24
6332105F	2	56
6332105F	6	99
6332105F	8	54
6332105F	22	63
6332105F	26	20
6332105F	30	35
6332110S	34	26
6332303J	14	56
6332304F	14	52
6332304F	18	19
6332305J	36	17
6337106Q	12	86
6337107Q	4	32
6337112C	32	17
6380000L	22	20
6380001M	22	19
6550200G	30	44
9401020E	34	35

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